Kawasaki

KX250F

Motorcycle Service Manual

Quick Reference Guide

General Information	1
Periodic Maintenance	2
Fuel System	3
Cooling System	4
Engine Top End	5
Engine Right Side	6
Engine Lubrication System	7
Engine Removal/Installation	8
Crankshaft/Transmission	9
Wheels/Tires	10
Final Drive	11
Brakes	12
Suspension	13
Steering	14
Frame	15
Electrical System	16
Appendix	17

This quick reference guide will assist you in locating a desired topic or procedure.

- Bend the pages back to match the black tab of the desired chapter number with the black tab on the edge at each table of contents page.
- Refer to the sectional table of contents for the exact pages to locate the specific topic required.

Kawasaki

KX250F

Motorcycle Service Manual

All rights reserved. No parts of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic mechanical photocopying, recording or otherwise, without the prior written permission of Quality Assurance Division/Consumer Products & Machinery Company/Kawasaki Heavy Industries, Ltd., Japan.

No liability can be accepted for any inaccuracies or omissions in this publication, although every possible care has been taken to make it as complete and accurate as possible.

The right is reserved to make changes at any time without prior notice and without incurring an obligation to make such changes to products manufactured previously. See your Motorcycle dealer for the latest information on product improvements incorporated after this publication.

All information contained in this publication is based on the latest product information available at the time of publication. Illustrations and photographs in this publication are intended for reference use only and may not depict actual model component parts.

© 2005 Kawasaki Heavy Industries, Ltd. Fourth Edition (1) : May 22, 2007 (K)

LIST OF ABBREVIATIONS

A	ampere(s)	lb	pound(s)
ABDC	after bottom dead center	m	meter(s)
AC	alternating current	min	minute(s)
ATDC	after top dead center	N	newton(s)
BBDC	before bottom dead center	Pa	pascal(s)
BDC	bottom dead center	PS	horsepower
BTDC	before top dead center	psi	pound(s) per square inch
°C	degree(s) Celsius	r	revolution
DC	direct current	r/min, rpm	revolution(s) per minute
F	farad(s)	TDC	top dead center
°F	degree(s) Fahrenheit	TIR	total indicator reading
ft	foot, feet	V	volt(s)
g	gram(s) (mass)	W	watt(s)
h	hour(s)	Ω	ohm(s)
kg	(mass)		
kgf	(force)		
L	liter(s)		

Foreword

This manual is designed primarily for use by trained mechanics in a properly equipped shop. However, it contains enough detail and basic information to make it useful to the owner who desires to perform his own basic maintenance and repair work. A basic knowledge of mechanics, the proper use of tools, and workshop procedures must be understood in order to carry out maintenance and repair satisfactorily. Whenever the owner has insufficient experience or doubts his ability to do the work, all adjustments, maintenance, and repair should be carried out only by qualified mechanics.

In order to perform the work efficiently and to avoid costly mistakes, read the text, thoroughly familiarize yourself with the procedures before starting work, and then do the work carefully in a clean area. Whenever special tools or equipment are specified, do not use makeshift tools or equipment. Precision measurements can only be made if the proper instruments are used, and the use of substitute tools may adversely affect safe operation.

To get the longest life out of your vehicle:

- Follow the Periodic Maintenance Chart in the Service Manual.
- Be alert for problems and non-scheduled maintenance.
- Use proper tools and genuine Kawasaki Motorcycle parts. Special tools, gauges, and testers that are necessary when servicing Kawasaki motorcycles are introduced by the Service Manual. Genuine parts provided as spare parts are listed in the Parts Catalog.
- Follow the procedures in this manual carefully. Don't take shortcuts.
- Remember to keep complete records of maintenance and repair with dates and any new parts installed.

How to Use This Manual

In this manual, the product is divided into its major systems and these systems make up the manual's chapters. The Quick Reference Guide shows you all of the product's system and assists in locating their chapters. Each chapter in turn has its own comprehensive Table of Contents.

For example, if you want stick coil information, use the Quick Reference Guide to locate the Electrical System chapter. Then, use the Table of Contents on the first page of the chapter to find the Stick Coil section.

Whenever you see these WARNING and CAUTION symbols, heed their instructions! Always follow safe operating and maintenance practices.

⚠ WARNING

This warning symbol identifies special instructions or procedures which, if not correctly followed, could result in personal injury, or loss of life.

CAUTION

This caution symbol identifies special instructions or procedures which, if not strictly observed, could result in damage to or destruction of equipment.

This manual contains four more symbols (in addition to WARNING and CAUTION) which will help you distinguish different types of information.

NOTE

○*This note symbol indicates points of particular interest for more efficient and convenient operation.*

- Indicates a procedural step or work to be done.

○Indicates a procedural sub-step or how to do the work of the procedural step it follows. It also precedes the text of a NOTE.

★Indicates a conditional step or what action to take based on the results of the test or inspection in the procedural step or sub-step it follows.

In most chapters an exploded view illustration of the system components follows the Table of Contents. In these illustrations you will find the instructions indicating which parts require specified tightening torque, oil, grease or a locking agent during assembly.

General Information

Table of Contents

Before Servicing 1-2
Model Identification..... 1-7
General Specifications..... 1-8
Unit Conversion Table 1-10

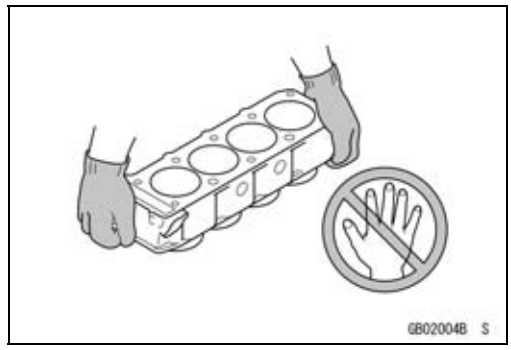
Before Servicing

Before starting to perform an inspection service or carry out a disassembly and reassembly operation on a motorcycle, read the precautions given below. To facilitate actual operations, notes, illustrations, photographs, cautions, and detailed descriptions have been included in each chapter wherever necessary. This section explains the items that require particular attention during the removal and reinstallation or disassembly and reassembly of general parts.

Especially note the following:

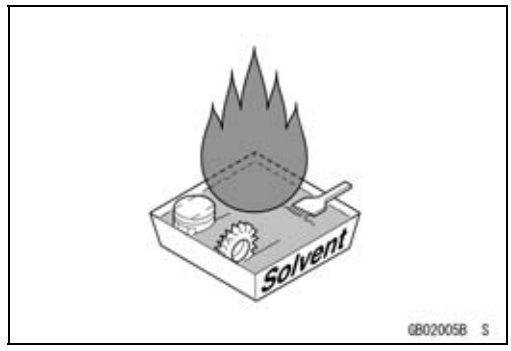
Edges of Parts

Lift large or heavy parts wearing gloves to prevent injury from possible sharp edges on the parts.



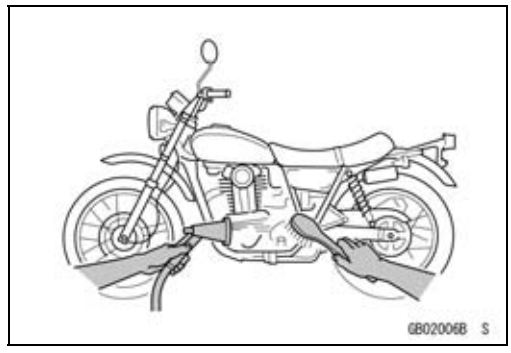
Solvent

Use a high-flush point solvent when cleaning parts. High -flush point solvent should be used according to directions of the solvent manufacturer.



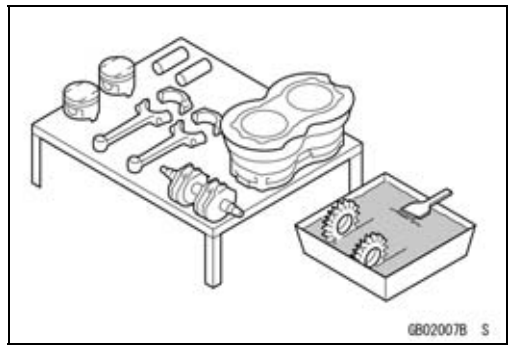
Cleaning Vehicle before Disassembly

Clean the vehicle thoroughly before disassembly. Dirt or other foreign materials entering into sealed areas during vehicle disassembly can cause excessive wear and decrease performance of the vehicle.



Arrangement and Cleaning of Removed Parts

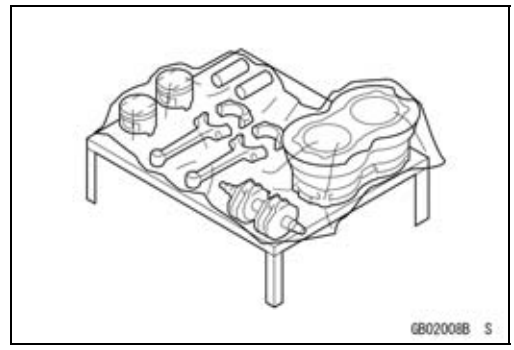
Disassembled parts are easy to confuse. Arrange the parts according to the order the parts were disassembled and clean the parts in order prior to assembly.



Before Servicing

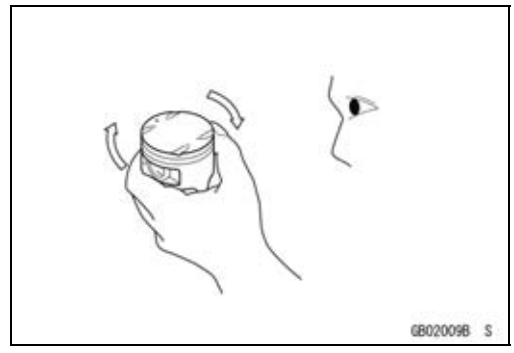
Storage of Removed Parts

After all the parts including subassembly parts have been cleaned, store the parts in a clean area. Put a clean cloth or plastic sheet over the parts to protect from any foreign materials that may collect before re-assembly.



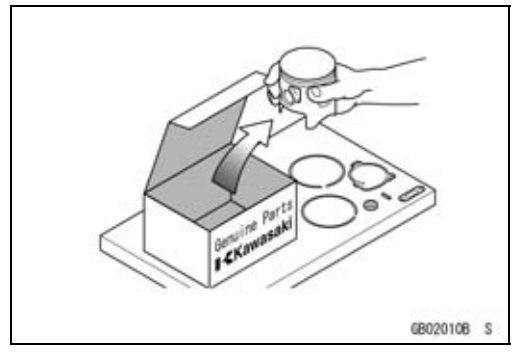
Inspection

Reuse of worn or damaged parts may lead to serious accident. Visually inspect removed parts for corrosion, discoloration, or other damage. Refer to the appropriate sections of this manual for service limits on individual parts. Replace the parts if any damage has been found or if the part is beyond its service limit.



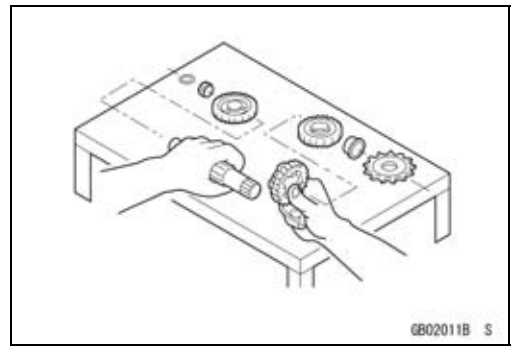
Replacement Parts

Replacement parts must be KAWASAKI genuine or recommended by KAWASAKI. Gaskets, O-rings, oil seals, grease seals, circlips or cotter pins must be replaced with new ones whenever disassembled.



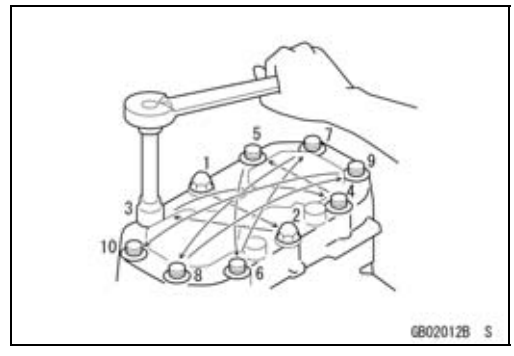
Assembly Order

In most cases assembly order is the reverse of disassembly, however, if assembly order is provided in this Service Manual, follow the procedures given.



Tightening Sequence

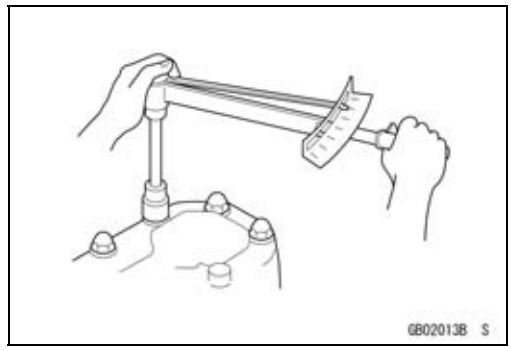
Generally, when installing a part with several bolts, nuts, or screws, start them all in their holes and tighten them to a snug fit. Then tighten them according to the specified sequence to prevent case warpage or deformation which can lead to malfunction. Conversely when loosening the bolts, nuts, or screws, first loosen all of them by about a quarter turn and then remove them. If the specified tightening sequence is not indicated, tighten the fasteners alternating diagonally.



Before Servicing

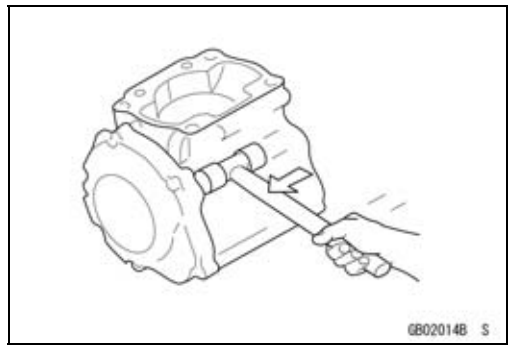
Tightening Torque

Incorrect torque applied to a bolt, nut, or screw may lead to serious damage. Tighten fasteners to the specified torque using a good quality torque wrench. Often, the tightening sequence is followed twice-initial tightening and final tightening with torque wrench.



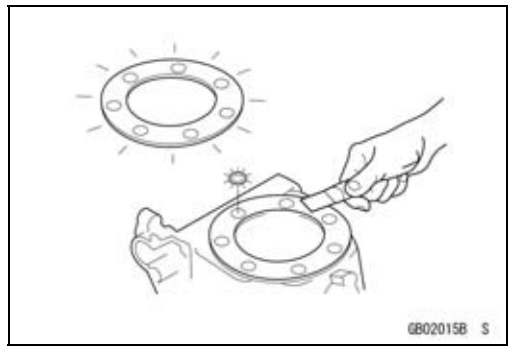
Force

Use common sense during disassembly and assembly, excessive force can cause expensive or hard to repair damage. When necessary, remove screws that have a non -permanent locking agent applied using an impact driver. Use a plastic-faced mallet whenever tapping is necessary.



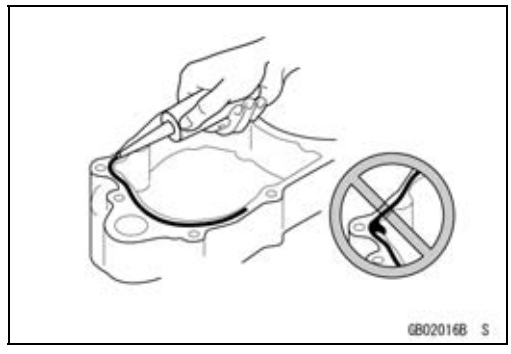
Gasket, O-ring

Hardening, shrinkage, or damage of both gaskets and O-rings after disassembly can reduce sealing performance. Remove old gaskets and clean the sealing surfaces thoroughly so that no gasket material or other material remains. Install new gaskets and replace used O-rings when re-assembling.



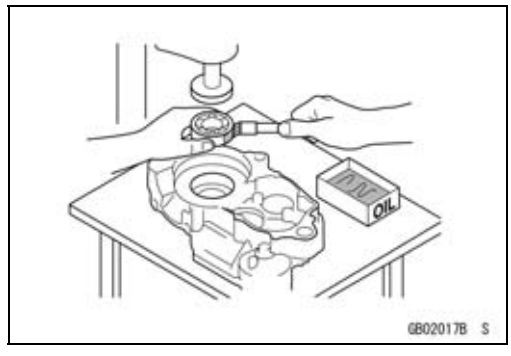
Liquid Gasket, Non-permanent Locking Agent

For applications that require Liquid Gasket or a Non-permanent Locking Agent, clean the surfaces so that no oil residue remains before applying liquid gasket or non-permanent locking agent. Do not apply them excessively. Excessive application can clog oil passages and cause serious damage.



Press

For items such as bearings or oil seals that must be pressed into place, apply small amount of oil to the contact area. Be sure to maintain proper alignment and use smooth movements when installing.

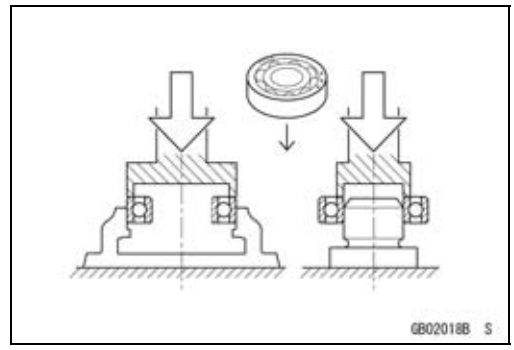


Before Servicing

Ball Bearing and Needle Bearing

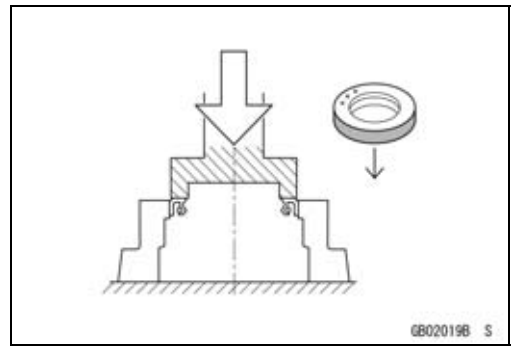
Do not remove pressed ball or needle unless removal is absolutely necessary. Replace with new ones whenever removed. Press bearings with the manufacturer and size marks facing out. Press the bearing into place by putting pressure on the correct bearing race as shown.

Pressing the incorrect race can cause pressure between the inner and outer race and result in bearing damage.

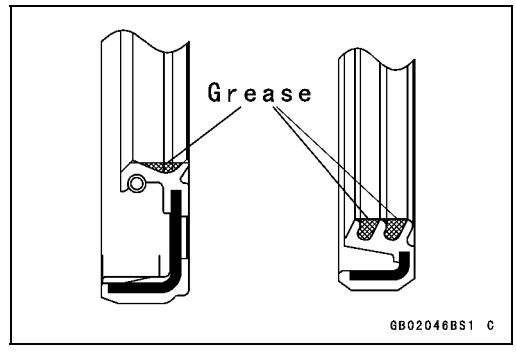


Oil Seal, Grease Seal

Do not remove pressed oil or grease seals unless removal is necessary. Replace with new ones whenever removed. Press new oil seals with manufacture and size marks facing out. Make sure the seal is aligned properly when installing.

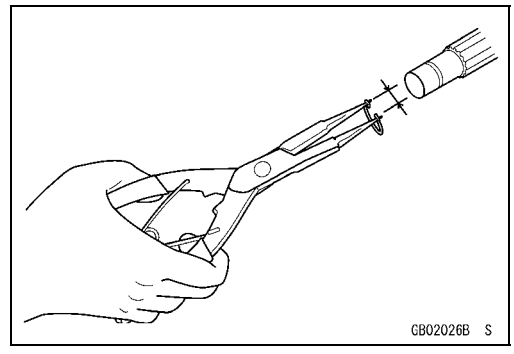


Apply specified grease to the lip of seal before installing the seal.



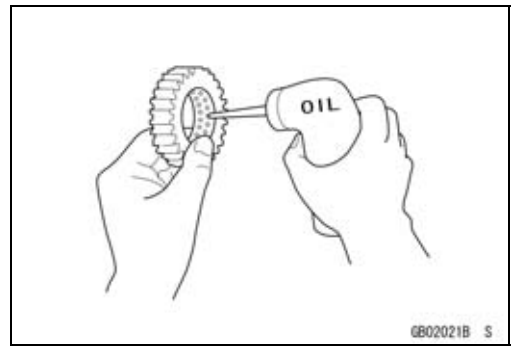
Circlips, Cotter Pins

Replace circlips or cotter pins that were removed with new ones. Take care not to open the clip excessively when installing to prevent deformation.



Lubrication

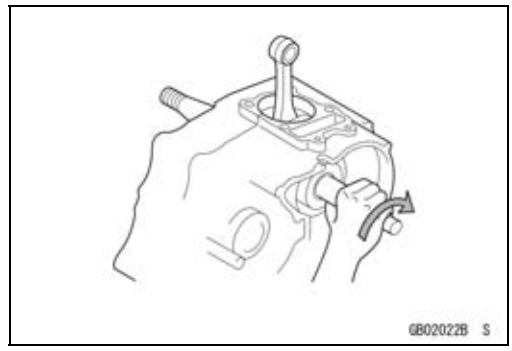
It is important to lubricate rotating or sliding parts during assembly to minimize wear during initial operation. Lubrication points are called out throughout this manual, apply the specific oil or grease as specified.



Before Servicing

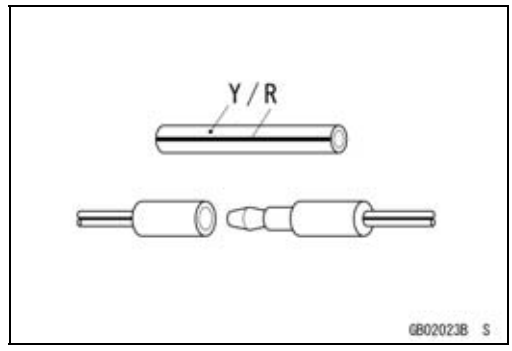
Direction of Engine Rotation

When rotating the crankshaft by hand, the free play amount of rotating direction will affect the adjustment. Rotate the crankshaft to positive direction (clockwise viewed from output side).



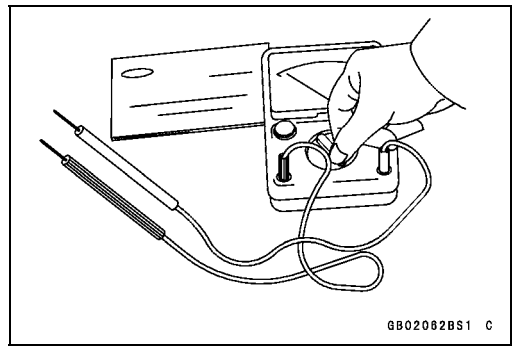
Electrical Wires

A two-color wire is identified first by the primary color and then the stripe color. Unless instructed otherwise, electrical wires must be connected to those of the same color.



Instrument

Use a meter that has enough accuracy for an accurate measurement. Read the manufacture's instructions thoroughly before using the meter. Incorrect values may lead to improper adjustments.



Model Identification

KX250T6F Left Side View

KX250T6F Right Side View

General Specifications

Items	KX250T6F ~ T8F
Dimensions	
Overall Length	2 160 mm (85.04 in.)
Overall Width	820 mm (32.3 in.)
Overall Height	1 270 mm (50 in.)
Wheelbase	1 469 mm (57.83 in.)
Road Clearance	372 mm (14.6 in.) (KX250T6F), 335 mm (13.2 in.) (KX250T7F ~)
Seat Height	960 mm (37.8 in.) (KX250T6F), 955 mm (37.6 in.) (KX250T7F ~)
Dry Mass	92.5 kg (204 lb)
Curb Mass:	
Front	49.9 kg (110 lb)
Rear	52.6 kg (116 lb)
Fuel Tank Capacity	7.2 L (1.9 US gal)
Performance	
Minimum Turning Radius	–
Engine	
Type	4-stroke, single cylinder, DOHC 4 valve
Cooling System	Liquid-cooled
Bore and Stroke	77.0 × 53.6 mm (3.03 × 2.11 in.)
Displacement	249 cm³ (15.2 cu in.)
Compression Ratio	13.5 : 1
Carburetion System	Carburetor, KEIHIN FCR37
Starting System	Primary kick
Ignition System	Digital AC-CDI
Timing Advance	
Ignition Timing	BTDC 8° @2 000 r/min (rpm)
Spark Plug	NGK CR8E
Valve Timing	
Inlet	
Open	BTDC 41°
Close	ABDC 71°
Duration	292°
Exhaust	
Open	BBDC 69°
Close	ATDC 49°
Duration	298°
Lubrication System	Forced lubrication (semi-dry sump)
Engine Oil:	
Grade	API SG, SH, SJ or SL with JASO MA
Viscosity	SAE 10W-40
Capacity	1.5 L (1.6 USqt)
Drive Train	
Primary Reduction System:	
Type	Gear
Reduction Ratio	3.350 (67/20)

General Specifications

Items	KX250T6F ~ T8F
Clutch Type	Wet, multi disc, Manual
Transmission:	
Type	5-speed, constant mesh, return shift
Gear Ratios:	
1st	2.142 (30/14)
2nd	1.785 (25/14)
3rd	1.444 (26/18)
4th	1.200 (24/20)
5th	1.052 (20/19) (KX250T6F), 1.045 (23/22) (KX250T7F ~)
Final Drive System:	
Type	Chain drive
Reduction Ratio	3.692 (48/13)
Overall Drive Ratio	13.020 @Top gear (KX250T6F), 12.931 @Top gear (KX250T7F ~)
Frame	
Type	semi-double cradle
Steering Angle	42° to either side
Caster (Rake Angle)	27.7°
Trail	119 mm (4.69 in.)
Front Wheel:	
Tire Size	80/100-21 51M
Tire Make/Type	BRIDGESTONE M401, Tube type (KX250T6F ~ T7F) BRIDGESTONE M403, Tube type (KX250T8F) BRIDGESTONE M201 (EUR), Tube type
Rim Size	21 × 1.60
Rear Wheel:	
Tire Size	100/90-19 57M
Tire Make/Type	BRIDGESTONE M402, Tube type (KX250T6F ~ T7F) BRIDGESTONE M404, Tube type (KX250T8F) BRIDGESTONE M202 (EUR), Tube type
Rim Size	19 × 1.85
Front Suspension:	
Type	Telescopic fork (up side down)
Wheel Travel	315 mm (12.4 in.)
Rear Suspension:	
Type	Swingarm (New Uni-trak)
Wheel Travel	310 mm (12.2 in.)
Brake Type:	
Front and Rear	Single disc
Effective Disc Diameter:	
Front (effect. dia.)	225 mm (8.86 in.)
Rear (effect. dia.)	215 mm (8.46 in.)

EUR: Europe Model

Specifications are subject to change without notice, and may not apply to every country.

Unit Conversion Table

Prefixes for Units:

Prefix	Symbol	Power
mega	M	× 1 000 000
kilo	k	× 1 000
centi	c	× 0.01
milli	m	× 0.001
micro	**μ**	× 0.000001

Units of Mass:

kg	×	2.205	=	lb
g	×	0.03527	=	oz

Units of Volume:

L	×	0.2642	=	gal (US)
L	×	0.2200	=	gal (imp)
L	×	1.057	=	qt (US)
L	×	0.8799	=	qt (imp)
L	×	2.113	=	pint (US)
L	×	1.816	=	pint (imp)
mL	×	0.03381	=	oz (US)
mL	×	0.02816	=	oz (imp)
mL	×	0.06102	=	cu in

Units of Force:

N	×	0.1020	=	kgf
N	×	0.2248	=	lb
kgf	×	9.807	=	N
kgf	×	2.205	=	lb

Units of Length:

km	×	0.6214	=	mile
m	×	3.281	=	ft
mm	×	0.03937	=	in

Units of Torque:

N·m	×	0.1020	=	kgf·m
N·m	×	0.7376	=	ft·lb
N·m	×	8.851	=	in·lb
kgf·m	×	9.807	=	N·m
kgf·m	×	7.233	=	ft·lb
kgf·m	×	86.80	=	in·lb

Units of Pressure:

kPa	×	0.01020	=	kgf/cm²
kPa	×	0.1450	=	psi
kPa	×	0.7501	=	cm Hg
kgf/cm²	×	98.07	=	kPa
kgf/cm²	×	14.22	=	psi
cm Hg	×	1.333	=	kPa

Units of Speed:

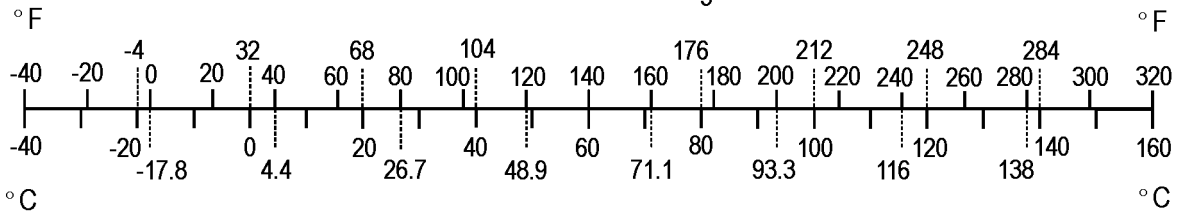
km/h	×	0.6214	=	mph

Units of Power:

kW	×	1.360	=	PS
kW	×	1.341	=	HP
PS	×	0.7355	=	kW
PS	×	0.9863	=	HP

Units of Temperature:

$$\frac{9(°C+40)}{5} - 40 = °F \qquad \frac{5(°F+40)}{9} - 40 = °C$$



Periodic Maintenance

Table of Contents

Periodic Maintenance Chart 2-3
Torque and Locking Agent 2-5
Specifications 2-10
Special Tools 2-13
Periodic Maintenance Procedures 2-14
  Fuel System 2-14
    Fuel Hose and Connection Inspection 2-14
    Throttle Grip (Throttle Cable) Free Play Inspection 2-14
    Throttle Grip (Throttle Cable) Free Play Adjustment 2-14
    Hot Starter Lever (Hot Starter Cable) Free Play Inspection 2-15
    Idle Speed Inspection (Carburetor Inspection) 2-15
    Idle Speed Adjustment (Carburetor Adjustment) 2-16
    Air Cleaner Element Cleaning and Inspection 2-17
    Fuel System Clean 2-19
  Cooling System 2-20
    Coolant Level Inspection 2-20
    Coolant Deterioration Inspection 2-21
    Water Hoses and Connections Inspection 2-21
  Engine Top End 2-22
    Valve Clearance Inspection 2-22
    Valve Clearance Adjustment 2-22
    Cylinder Head Warp Inspection 2-24
    Cylinder Wear Inspection 2-25
    Piston/Cylinder Clearance Inspection 2-25
    Piston, Piston Ring and Piston Pin Replacement 2-25
    Exhaust System Inspection 2-26
    Muffler Baffle Change 2-26
  Engine Right Side 2-27
    Clutch Inspection 2-27
    Clutch Plates Inspection 2-28
  Engine Lubrication System 2-29
    Engine Oil Change 2-29
    Oil Filter Change 2-30
    Breather Hose Inspection 2-31
  Crankshaft/Transmission 2-31
    Crankshaft Inspection 2-31
  Wheel/Tires 2-32
    Air Pressure Inspection/Adjustment 2-32
    Tires Inspection 2-32
    Spoke Tightness Inspection 2-33
    Rim Runout Inspection 2-33
    Wheel Bearing Inspection 2-34
  Final Drive 2-34
    Drive Chain Wear Inspection 2-34
    Drive Chain Slack Inspection 2-35
    Drive Chain Slack Adjustment 2-35

Drive Chain Lubrication 2-36
Sprocket Wear Inspection 2-37
Rear Sprocket Warp (Runout) Inspection 2-37
Brakes 2-37
Brake Lever and Pedal Adjustment 2-37
Brake Fluid Level Inspection 2-39
Brake Fluid Change 2-40
Brake Pad Wear Inspection 2-42
Brake Master Cylinder Cup and Dust Cover Replacement 2-42
Caliper Fluid Seal and Dust Seal Replacement 2-43
Brake Hoses and Connections Inspection 2-46
Brake Hose Replacement 2-46
Suspension 2-48
Front Fork Inspection 2-48
Front Fork Oil Change (each fork leg) 2-48
Rear Shock Absorber Oil Change 2-58
Swingarm and Uni-Trak Linkage Inspection 2-67
Swingarm and Uni-Track Linkage Pivot Lubrication 2-68
Steering 2-68
Steering Inspection 2-68
Steering Adjustment 2-68
Steering Stem Bearing Lubrication 2-70
Frame 2-71
Frame Inspection 2-71
Electrical System 2-71
Spark Plug Cleaning and Inspection 2-71
Spark Plug Replacement 2-72
General Lubrication and Cable Inspection 2-72
Lubrication 2-72
Nut, Bolt, and Fastener Tightness Inspection 2-73
Tightness Inspection 2-73

Periodic Maintenance Chart

The maintenance must be done in accordance with this chart to keep the motorcycle in good running condition.

	FREQUENCY / OPERATION	Each race or 2.5 hr	Every 3 races or 7.5 hr	Every 6 races or 15 hr	Every 12 races or 30 hr	See Page
ENGINE	Spark plug - clean, inspect †	●				2-70
	Spark plug - replace		●			2-71
	Clutch - inspect	●				2-26
	Clutch plates - inspect †	●				2-27
	Throttle cable - inspect and adjust	●				2-13
	Air cleaner element - clean	●				2-16
	Air cleaner element - replace	If damaged				2-16
	Carburetor - inspect and adjust	●				2-14
	Engine Oil - change			●		2-28
	Piston and piston ring - replace			●		2-24
	Cylinder head, cylinder - inspect			●		2-23
	Piston pin - replace				●	2-24
	Valve clearance - inspect †			●		2-21
	Hot starter cable - inspect	●				2-14
	Oil filter - replace			●		2-29
	Exhaust system - inspect†	●				2-25
	Muffler baffle- change		●			2-25
	Kick pedal and shift pedal - clean	●				–
	Engine sprocket - inspect †	●				2-36
	Coolant level - inspect	●				2-19
	Water hoses and connections - inspect †	●				2-20
	Crankshaft - inspect			●		2-30
	Breather hose - inspect	●				2-29
CHASSIS	Brake - adjust †	●				2-36
	Brake pad wear - inspect †	●				2-41
	Brake fluid level - inspect †	●				2-38
	Brake fluid - change	Every 2 years				2-39
	Brake master cylinder cup and dust cover - replace	Every 2 years				2-41
	Brake caliper fluid seal and dust seal - replace	Every 2 years				2-42
	Brake hoses and pipe - replace	Every 4 years				2-45
	Brake hoses, connections - inspect †	●				2-45
	Spoke tightness and rim runout - inspect †	●				2-31
	Wheel bearing - inspect †	●				2-32
	Frame - inspect	●				2-70
	Drive chain wear - inspect †	●				2-33
	Drive chain - inspect and adjust	●				2-34
	Drive chain - lubricate	●				2-35

2-4 PERIODIC MAINTENANCE

Periodic Maintenance Chart

OPERATION / FREQUENCY	Each race or 2.5 hr	Every 3 races or 7.5 hr	Every 6 races or 15 hr	Every 12 races or 30 hr	See Page
Wheels/tires - inspect	●				2-30
Rear sprocket - inspect †	●				2-36
Front fork - inspect and clean	●				2-47
Front fork oil - change			●		2-47
Rear shock absorber oil - change			●		2-57
Cable - inspect	●				2-71
Fuel hose - replace	Every 4 years				2-13
Fuel hose, connections - inspect †	●				2-13
Fuel system - clean		●			2-18
Steering play - inspect †	●				2-67
Steering stem bearing - lubricate			●		2-69
Swingarm and Uni-Trak linkage pivots - lubricate		●			2-67
Swingarm and Uni-Trak linkage pivots - inspect †		●			2-66
Nuts, bolts, fasteners - inspect †	●				2-72
General lubrication - perform	●				2-71

†: Replace, add, adjust, clean or torque if necessary.

Torque and Locking Agent

Tighten all bolts and nuts to the proper torque using an accurate torque wrench. If insufficiently tightened, a bolt or nut may become damaged, strip an internal thread, or break and then fall out. The following table lists the tightening toque for the major bolts and nuts, and the parts requiring use of a non-permanent locking agent or liquid gasket.

When checking the tightening toque of the bolts and nuts, first loosen the bolt or nut by half a turn and then tighten to specified torque.

Letters used in the "Remarks" column mean:

AL: Tighten the two clamp bolts alternately two times to ensure even tightening torque.
G: Apply grease.
L: Apply a non-permanent locking agent to the threads.
Lh: Left-hand Threads
MO: Apply molybdenum disulfide oil (mixture of engine oil and molybdenum disulfide grease with a weight ratio 10 : 1).
S: Tighten the fasteners following the specified sequence.
St: Stake the fasteners to prevent loosening.

Basic Torque for General Fasteners

Threads dia. (mm)	Torque		
	N·m	kgf·m	ft·lb
5	3.4 ~ 4.9	0.35 ~ 0.50	30 ~ 43 in·lb
6	5.9 ~ 7.8	0.60 ~ 0.80	52 ~ 69 in·lb
8	14 ~ 19	1.4 ~ 1.9	10.0 ~ 13.5
10	25 ~ 34	2.6 ~ 3.5	19.0 ~ 25
12	44 ~ 61	4.5 ~ 6.2	33 ~ 45
14	73 ~ 98	7.4 ~ 10.0	54 ~ 72
16	115 ~ 155	11.5 ~ 16.0	83 ~ 115
18	165 ~ 225	17.0 ~ 23.0	125 ~ 165
20	225 ~ 325	23 ~ 33	165 ~ 240

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Fuel System				
Air Cleaner Element Wing Bolt	–	–	–	Hand Tighten
Throttle Pulley Cover Bolt	3.4	0.35	30 in·lb	
Throttle Cable Bolts	7.0	0.7	61 in·lb	
Hot Starter Plunger Cap Bolt	1.0	0.1	10 in·lb	
Air Cleaner Duct Bolt and Nuts	3.0	0.3	27 in·lb	
Rear Frame Mounting Bolts	34	3.5	25	
Air Cleaner Housing Bolts	9.8	1.0	87 in·lb	
Air Cleaner Duct Clamp Screws	3.0	0.3	27 in·lb	
Carburetor Holder Clamp Screws	2.0	0.2	17 in·lb	
Fuel Tap Plate Mounting Screws	0.8	0.08	7 in·lb	
Cooling System				
Right Engine Cover Bolt	9.8	1.0	87 in·lb	
Water Pipe Bolt	9.8	1.0	87 in·lb	
Water Pump Cover Bolts	9.8	1.0	87 in·lb	L (1)
Water Pump Cover Bolts (with washer)	9.8	1.0	87 in·lb	L (1)
Water Pump Impeller Bolt	7.0	0.7	61 in·lb	

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Water Hose Clamp Screws	1.5	0.15	13 in·lb	
Radiator Screen Bolts	9.8	1.0	87 in·lb	
Coolant Drain Plug	7.0	0.7	61 in·lb	
Radiator Mounting Bolts	9.8	1.0	87 in·lb	
Radiator Shroud Bolts	9.8	1.0	87 in·lb	
Engine Top End				
Auto-Decompressor Bolt	12	1.2	104 in·lb	
Decompressor Plug Plate Bolt	9.8	1.0	87 in·lb	
Cylinder Head Cover Bolts	9.8	1.0	87 in·lb	
Cylinder Head Bolts:				
M10	49	5.0	36	S, MO
M6	12	1.2	104 in·lb	S
Camshaft Cap Bolts	9.8	1.0	87 in·lb	S
Carburetor Holder Clamp Screws	2.0	0.2	17 in·lb	
Plug	20	2.0	14	L
Lower Camshaft Chain Guide Bolt	9.8	1.0	87 in·lb	
Rear Camshaft Chain Guide Bolt	15	1.5	11	
Exhaust Pipe Stud	–	–	–	L (Planted side)
Camshaft Chain Tensioner Mounting Bolts	9.8	1.0	87 in·lb	
Camshaft Chain Tensioner Cap Bolt	20	2.0	14.5	
Cylinder Bolt M6	12	1.2	104 in·lb	S
Exhaust Pipe Cover Screws	12	1.2	104 in·lb	
Exhaust Pipe Holder Nuts	21	2.1	15	S
Muffler Mounting Bolts	21	2.1	15	S
Muffler Pipe Mounting Bolts	12	1.2	104 in·lb	L
Engine Right Side				
Primary Gear Nut	98	10	72	Lh
Shift Drum Cam Bolt	24	2.4	17	L
Clutch Spring Bolts	9.8	1.0	87 in·lb	
Clutch Hub Nut	98	10	72	St
Gear Set Lever Nut	8.8	0.9	78 in·lb	
Gear Set Lever Pivot Stud	–	–	–	L (Planted Side)
Ratchet Plate Mounting Bolt	9.8	1.0	87 in·lb	L
Ratchet Plate Mounting Screw (KX250T6F)	6.4	0.65	56 in·lb	L
Ratchet Plate Mounting Bolt	15	1.5	11	L
Kick Ratchet Guide Bolt	8.8	0.9	78 in·lb	L
Kick Pedal Mounting Bolt	25	2.5	18	L
Shift Pedal Bolt	9.8	1.0	87 in·lb	
Oil Filler Plug	5.0	0.51	44 in·lb	
Clutch Cover Bolts (with right engine cover)	9.8	1.0	87 in·lb	L (2)

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Clutch Cover Bolts	9.8	1.0	87 in·lb	
Right Engine Cover Bolts	9.8	1.0	87 in·lb	
Engine Lubrication System				
Engine Oil Drain Bolt M10 (for transmission room oil sump)	20	2.0	14.5	
Engine Oil Drain Bolt M6 (for crank room oil sump)	7.0	0.7	61 in·lb	
Oil Filter Cap Bolts	9.8	1.0	87 in·lb	
Oil Pump Mounting Bolts	7.0	0.7	61 in·lb	L
Water Pump Cover Bolts	9.8	1.0	87 in·lb	L (1)
Water Pump Cover Bolt (with washer)	9.8	1.0	87 in·lb	L (1)
Right Engine Cover Bolts	9.8	1.0	87 in·lb	
Breather Fitting	15	1.5	11	L
Oil Pump Idle Gear Shaft Screws	6.4	0.65	56 in·lb	L
Engine Removal/Installation				
Engine Mounting Nuts	49	5.0	33	
Engine Bracket Nuts	29	3.0	22	
Swingarm Pivot Shaft Nut	98	10	72	
Crankshaft/Transmission				
Breather Fitting	15	1.5	11	L
Reed Valve Screws	7.0	0.7	61 in·lb	
Piston Oil Nozzle	2.9	0.29	26 in·lb	
Crankcase Bolts	9.8	1.0	87 in·lb	S
Engine Oil Drain Bolt (for crank room oil sump)	7.0	0.7	61 in·lb	
Engine Oil Drain Bolt (for transmission room oil sump)	20	2.0	14.5	
Output Shaft Bearing Retaining Screw (KX250T6F)	6.4	0.65	56 in·lb	L
Output Shaft Bearing Retaining Bolts	12	1.2	104	L
Drive Shaft Bearing Retaining Screw (KX250T6F)	6.4	0.65	56 in·lb	L
Drive Shaft Bearing Retaining Bolt	9.8	1.0	87	L
Shift Drum Bearing Retaining Bolts	9.8	1.0	87 in·lb	L
Gear Set Lever Nut	8.8	0.9	78 in·lb	
Shift Drum Cam Bolt	24	2.4	17	L
Neutral Switch	12	1.2	104 in·lb	
Wheels/Tires				
Front Axle	79	8.0	58	
Front Axle Clamp Bolts	20	2.0	14.5	AL
Rear Axle Nut	108	11	80	
Spoke Nipple	Not less than 2.2	Not less than 0.22	Not less than 19 in·lb	

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Final Drive				
Rear Sprocket Nuts	34	3.5	25	
Engine Sprocket Cover Bolts	9.8	1.0	87 in·lb	
Brakes				
Brake Lever Pivot Bolt Locknut	5.9	0.6	52 in·lb	
Brake Reservoir Cap Screws	1.5	0.15	13 in·lb	
Brake Lever Pivot Bolt	5.9	0.6	52 in·lb	
Caliper Mounting Bolts (Front)	25	2.5	18	
Brake Hose Banjo Bolts	25	2.5	18	
Front Master Cylinder Clamp Bolts	8.8	0.9	78 in·lb	S
Rear Master Cylinder Mounting Bolts	9.8	1.0	87 in·lb	
Rear Master Cylinder Push Rod Locknut	17	1.7	12.5	
Brake Reservoir Cap Bolts	1.5	0.15	13 in·lb	
Brake Disc Mounting Bolts:				
(Front)	9.8	1.0	87 in·lb	L
(Rear)	23	2.3	16.5	L
Caliper Bleed Valves (Front, Rear)	7.8	0.8	69 in·lb	
Rear Caliper Holder Shaft	27	2.8	20	
Brake Pad Bolts	17	1.7	12.5	
Rear Brake Pad Bolt Plug	2.5	0.25	22 in·lb	
Brake Pedal Mounting Bolt	25	2.5	18	L, G
Suspension				
Front Fork Cylinder Unit	34	3.5	25	
Front Fork Clamp Bolts				
(Upper)	20	2.0	14.5	L, AL
(Lower)	20	2.0	14.5	AL
Front Fork Adjuster Assembly	69	7.0	51	L
Front Fork Base Valve Assembly	29	3.0	22	
Adjuster Assembly Locknut	22	2.2	16	
Pressure Relief Screw	1.3	0.13	11 in·lb	
Swingarm Pivot Shaft Nut	98	10	72	
Rear Shock Absorber Mounting Nuts:				
(Upper)	39	4.0	29	
(Lower)	34	3.5	25	
Rear Shock Absorber Spring Locknut	45	4.6	33	
Piston Rod Locknut	37	3.8	27	
Gas Reservoir Damping Adjuster Assembly	29	3.0	21	
Tie-Rod Mounting Nut (Front, Rear) (KX250T6F)	83	8.5	61	
Tie-Rod Mounting Nut (Front, Rear)	59	6.0	44	
Rocker Arm Pivot Nut (KX250T6F)	83	8.5	61	
Rocker Arm Pivot Nut	59	6.0	44	

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Steering				
Steering Stem Head Nut	98	10	72	
Steering Stem Locknut	4.9	0.5	43 in·lb	
Handlebar Clamp Bolts	25	2.5	18	S
Frame				
Footpeg Bracket Bolts (Upper)	54	5.5	40	L
Rear Frame Mounting Bolts	34	3.5	25	
Electrical System				
Neutral Switch	12	1.2	104 in·lb	
Neutral Switch Lead Terminal Screw	1.3	0.13	12 in·lb	
Flywheel Nut	49	5.0	36	
Flywheel Plug	5.0	0.5	44 in·lb	
Timing Inspection Plug	4.0	0.4	35 in·lb	
Stator Bolts	7.0	0.7	61 in·lb	
Crankshaft Sensor Bolts	7.0	0.7	61 in·lb	
Spark Plug	13	1.3	113 in·lb	
C.D.I. Unit Bolts	9.8	1.0	87 in·lb	
Magneto Cover Bolts				
L: 30	9.8	1.0	87 in·lb	
L: 35	9.8	1.0	87 in·lb	L

Specifications

Item	Standard	Service Limit
Fuel System		
Throttle Grip Free Play	2 ~ 3 mm (0.08 ~ 0.12 in.)	– – –
Hot Starter Lever Free Play	0.5 ~ 1.0 mm (0.02 ~ 0.04 in.)	– – –
Idle Speed	2 000 r/min (rpm)	– – –
Air Cleaner Element Oil	High quality foam air filter oil	– – –
Cooling System		
Coolant:		
Type (recommended)	Permanent type antifreeze	– – –
Color	Green	– – –
Mixed Ratio	Soft water 50% and coolant 50%	– – –
Freezing Point	-35°C (-31°F)	– – –
Total Amount	1.10 L (1.16 US qt)	– – –
Engine Top End		
Valve Clearance:		
Exhaust	0.17 ~ 0.22 mm (0.0067 ~ 0.0087 in.)	– – –
Inlet	0.10 ~ 0.15 mm (0.0039 ~ 0.0059 in.)	– – –
Cylinder Head Warp	– – –	0.05 mm (0.0020 in.)
Cylinder Inside Diameter (see text)	77.000 ~ 77.012 mm (3.0315 ~ 3.0320 in.)	77.06 mm (3.0339 in.)
Piston/cylinder Clearance	0.030 ~ 0.057 mm (0.0012 ~ 0.0022 in.)	– – –
Engine Right Side		
Clutch Lever Free Play	8 ~ 13 mm (0.3 ~ 0.5 in.)	– – –
Friction Plate Thickness	2.7 ~ 2.9 mm (0.106 ~ 0.114 in.)	2.6 mm (0.102 in.)
Steel Plate Thickness	1.5 ~ 1.7 mm (0.059 ~ 0.067 in.)	1.4 mm (0.055 in.)
Friction Plate Warp	0.15 mm (0.0059 in.) or less	0.3 mm (0.012 in.)
Steel Plate Warp	0.15 mm (0.0059 in.) or less	0.3 mm (0.012 in.)
Engine Lubrication System		
Engine Oil:		
Grade	Castrol “R4 superbike” 5W-40 (KX250T6F ~ T7F), Castrol “POWER1 R4 Racing” 5W-40 (KX250T8F) or	– – –
	API SG, SH, SJ or SL with JASO MA	– – –
Viscosity	SAE 10W-30, 10W-40, or 10W-50	– – –
Capacity	1.5 L (0.74 US qt)	– – –
Crankshaft/Transmission		
Connecting Rod Big End Side Clearance	0.25 ~ 0.35 mm (0.0098 ~ 0.0138 in.)	0.55 mm (0.0217 in.)

Specifications

Item	Standard	Service Limit
Wheels/Tires		
Rim Runout (with tire installed):		
Axial	TIR 1.0 mm (0.04 in.) or less	TIR 2 mm (0.08 in.)
Radial	TIR 1.0 mm (0.04 in.) or less	TIR 2 mm (0.08 in.)
Front and Rear Tires Air Pressure	100 kPa (1.0 kgf/cm², 14 psi)	– – –
Standard Tire:		
Front:		
Size	80/100-21 51M	– – –
Make	BRIDESTONE	– – –
Type	M401, Tube (KX250T6F ~ T7F) M403, Tube (KX250T8F)	– – –
	(EUR) M201, Tube	– – –
Rear:		
Size	100/90-19 57M	– – –
Make	BRIDESTONE	– – –
Type	M402, Tube (KX250T6F ~ T7F) M404, Tube (KX250T8F)	– – –
	(EUR) M202, Tube	– – –
Final Drive		
Drive Chain Slack	52 ~ 58 mm (2.05 ~ 2.28 in.)	– – –
Drive Chain 20 Link Length	317.5 ~ 318.2 mm (12.50 ~ 12.53 in.)	323 mm (12.72 in.)
Rear Sprocket Warp (Runout)	TIR 0.4 mm (0.016 in.) or less	TIR 0.5 mm (0.020 in.)
Brakes		
Brake Lever Free Play	(to suit rider)	– – –
Brake Fluid:		
Type:		
Front	DOT3 or DOT4	– – –
Rear	DOT4	– – –
Brake pad lining thickness:		
Front	4.0 mm (0.157 in.)	1 mm (0.04 in.)
Rear	6.4 mm (0.252 in.)	1 mm (0.04 in.)
Suspension		
Fork Oil:		
Oil Viscosity	SHOWA SS-05 or equivalanet	– – –

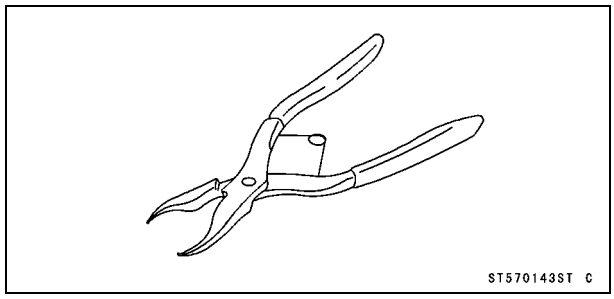
Specifications

Item	Standard	Service Limit
Oil Capacity (per unit):		
Cylinder Unit	193 mL (6.53 US oz.)	– – –
Oil Level	42 ~ 49 mm (1.65 ~ 1.93 in.)	– – –
Outer Tube	360 ±2.5 mL (12.2 ±0.08 US oz.) (KX250T6F)	(Adjustable range) 322 ~ 417 mL (10.9 ~ 14.1 US oz.) (KX250T6F)
	373 ±2.5 mL (12.6 ±0.08 US oz.) (KX250T7F ~)	324 ~ 419 mL (11.0 ~ 14.2 US oz.) (KX250T7F ~)
Rear Shock Absorber:		
Oil Viscosity	SHOWA SS-25 or equivalent	– – –
Oil Capacity	Approximately 395 mL (13.4 US oz.)	– – –
Electrical System		
Spark Plug Gap	0.7 ~ 0.8 mm (0.028 ~ 0.031 in.)	– – –

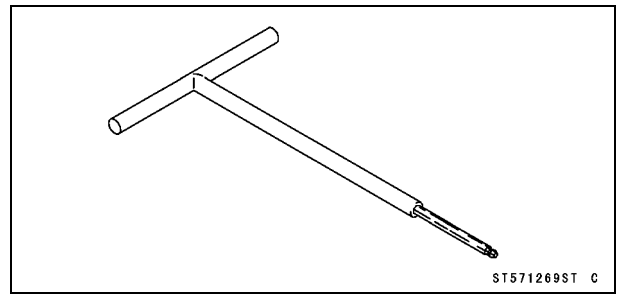
TIR: Total Indicator Readings
EUR: Europe Model

Special Tools

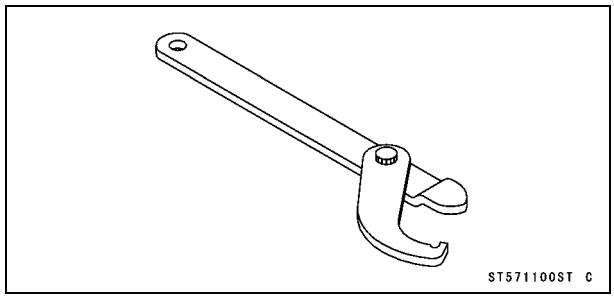
Inside Circlip Pliers:
57001-143



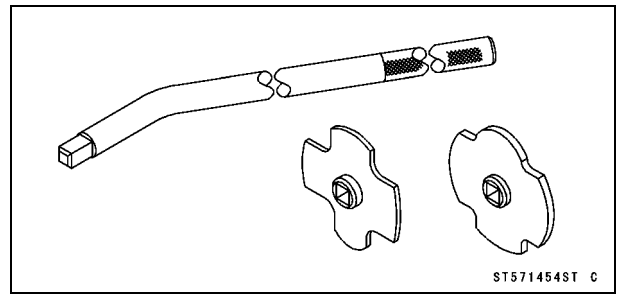
Carburetor Drain Plug Wrench, Hex 3:
57001-1269



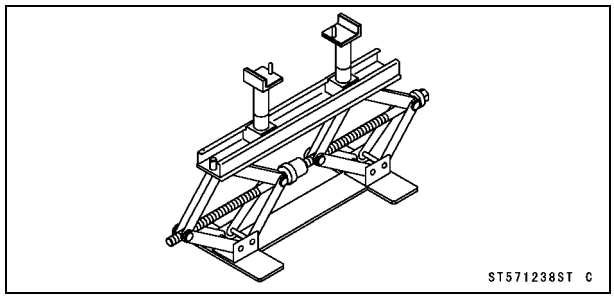
Steering Stem Nut Wrench:
57001-1100



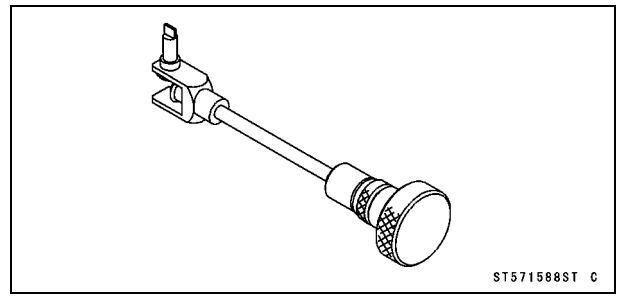
Filler Cap Driver:
57001-1454



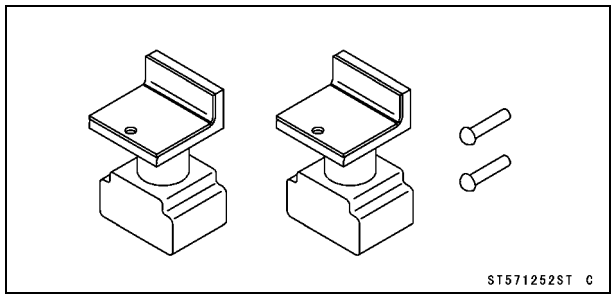
Jack:
57001-1238



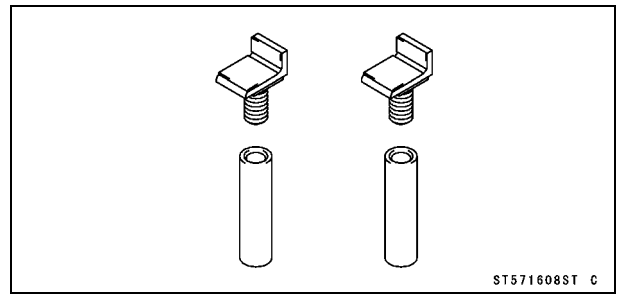
Pilot Screw Adjuster, D:
57001-1588



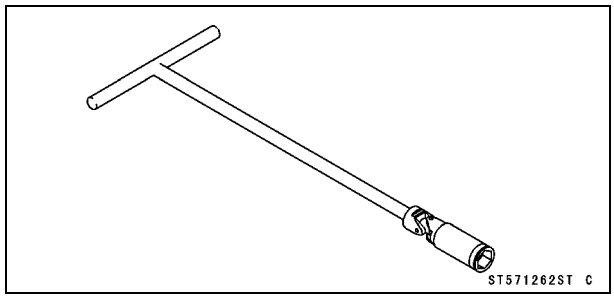
Attachment Jack:
57001-1252



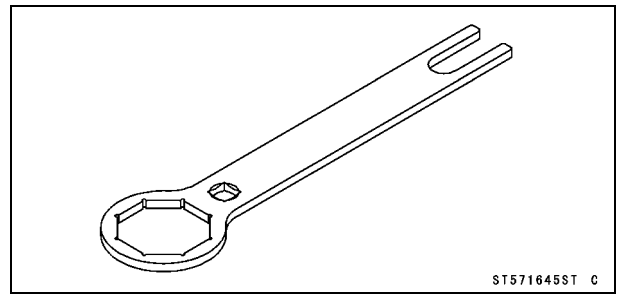
Jack Attachment:
57001-1608



Spark Plug Wrench, Hex 16:
57001-1262



Top Plug Wrench, 50 mm:
57001-1645



Periodic Maintenance Procedures

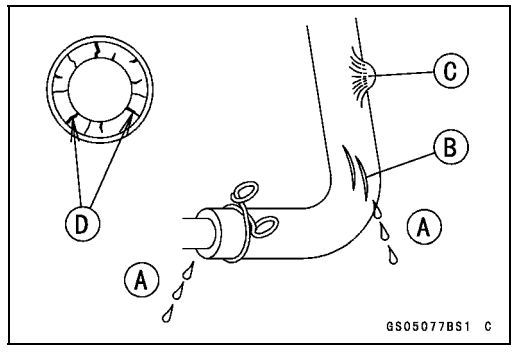
Fuel System

Fuel Hose and Connection Inspection

○If the motorcycle is not properly handled, the inside the fuel line can cause fuel to leak [A].

● Check the fuel hose.

★Replace the fuel hose if any fraying, cracks [B], bulges [C], or ozone cracks [D] are noticed.

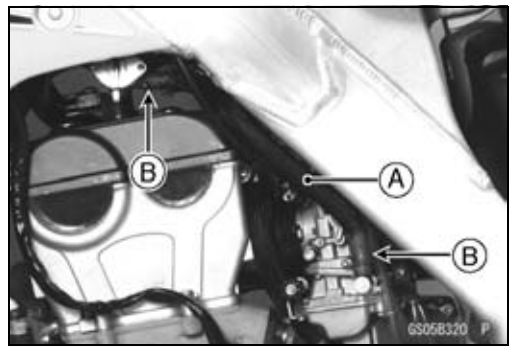


● Check that the hose [A] are securely connected and clamps [B] are tightened correctly.

● When installing, route the hose according to Cable, Wire, and Hose Routing section in the Appendix chapter.

● When installing the fuel hose, avoid sharp bending, kinking, flattening or twisting, and route the fuel hose with a minimum of bending so that the fuel flow will not be obstructed.

★Replace the hose if it has been sharply bent or kinked.

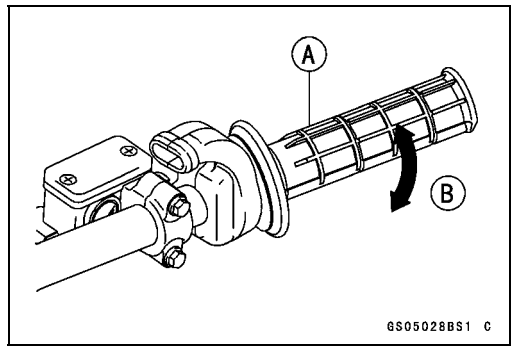


Throttle Grip (Throttle Cable) Free Play Inspection

● Check throttle grip free play [B] by lightly turning the throttle grip [A] back and forth.

★If the free play is improper, adjust the throttle cable.

Throttle Grip Free Play
Standard: 2 ~ 3 mm (0.08 ~ 0.12 in.)



● Check that the throttle grip moves smoothly from full open to close, and the throttle closes quickly and completely in all steering positions by the return spring.

★If the throttle grip does not return properly, check the throttle cable routing, grip free play, and cable damage. Then lubricate the throttle cable.

● Run the engine at the idle speed, and turn the handlebar all the way to the right and left to ensure that the idle speed does not change.

★If the idle speed increase, check the throttle cable free play and the cable routing.

Throttle Grip (Throttle Cable) Free Play Adjustment

● Loosen the locknuts [A] [B] at the upper end of the throttle cable.

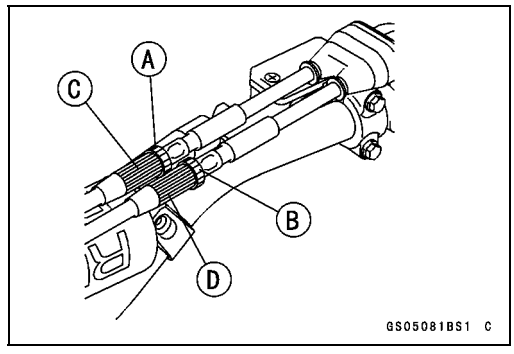
● Screw both throttle cable adjuster [C] [D] to give the throttle grip plenty of play.

● Turn out the decelerator adjuster [C] until there is no play when the throttle grip is completely closed.

● Tighten the locknut [A].

● Turn the accelerator cable adjuster [D] until 2 ~ 3 mm (0.08 ~ 0.12 in.) of throttle grip play is obtained.

● Tighten the locknut [B].



Periodic Maintenance Procedures

★If the throttle grip free play cannot be adjusted with the adjuster, replace the throttle cables.

- Turn the handlebar from side to side while idling the engine. If idle speed varies, the throttle cable may be poorly routed or it may be damaged.

⚠ WARNING

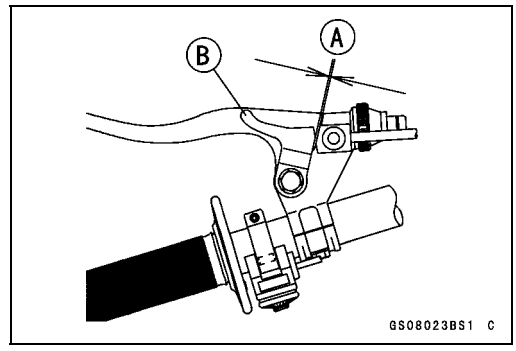
Operation with an improperly adjusted, incorrectly routed, or damaged cable could result in an unsafe riding condition.

Hot Starter Lever (Hot Starter Cable) Free Play Inspection

- Slide the clutch lever dust cover back.
- Check the hot starter lever play [A] when pulling the start lever [B] lightly.

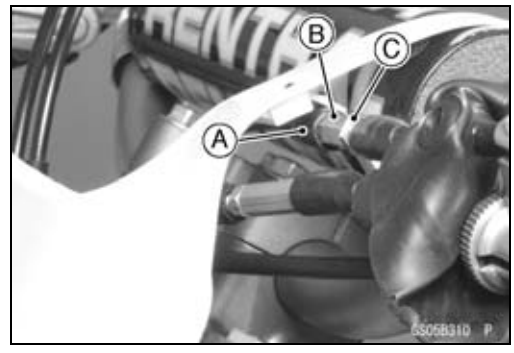
Hot Starter Lever Free Play
Standard: 0.5 ~ 1.0 mm (0.02 ~ 0.04 in.)

★If the free play is improper, adjust the hot starter cable.



- Slide the adjuster cover [A] back.
- Loosen the locknut [B] and turn the adjuster [C] to obtain the proper lever free play.
- Tighten the locknut securely.
- Check that the hot starter lever moves smoothly from full open to close, and the lever closes quickly and completely in all steering positions by the return spring.

★If the hot starter lever does not return properly, check the hot starter cable routing, free play and cable damage. Then lubricate the hot starter cable.



Idle Speed Inspection (Carburetor Inspection)

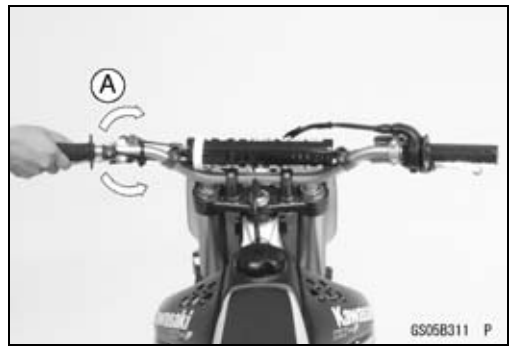
CAUTION

This motorcycle is designed for competition use only. Therefore, the radiator does not incorporate a coolant reserve tank or radiator fan. Prolonged idling of the engine with no airflow through the radiator can cause coolant loss and engine overheating resulting in possible engine damage. Any riding conditions that increase engine temperature will further reduce idling time before coolant loss occurs. These conditions include high ambient temperature, sandy or muddy terrain, or other conditions causing high engine loads at low speeds. Furthermore, warming the engine up excessively before operation, or leaving idling with the hot engine temperature after operation results in the engine overheating, too.

Periodic Maintenance Procedures

- Start the engine and warm it up thoroughly.
- With the engine idling, turn the handlebar to both sides [A].

★If handlebar movement changes the idle speed, the throttle cable may be improperly adjusted or incorrectly routed, or it may be damaged. Be sure to correct any of these conditions before riding (see Cable, Wire, and Hose Routing in the Appendix chapter).



⚠ WARNING

Operation with an improperly adjusted, incorrectly routed, or damaged cable could result in an unsafe riding condition.

- Check the idle speed, using the engine revolution tester [A] for high accuracy.

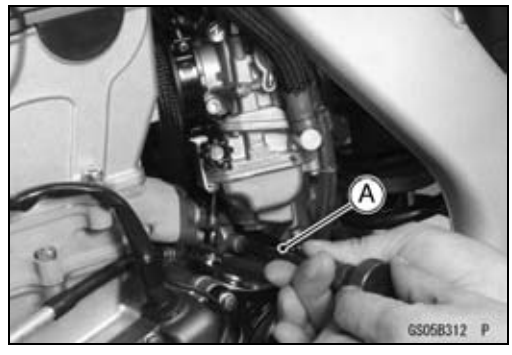
★If the idle speed is out of specified range, adjust it.

Idle Speed
Standard: 2 000 ±50 r/min (rpm)

Idle Speed Adjustment (Carburetor Adjustment)

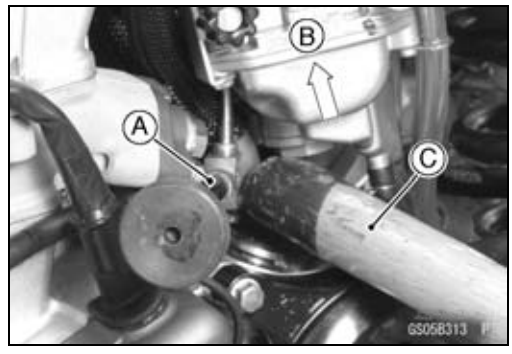
- First, turn in the air screw using the pilot screw adjuster [A], until it seats lightly, and back it out the specified number of turns. (see specifications section in the Fuel System chapter)

Special Tool - Pilot Screw Adjuster, D: 57001-1588

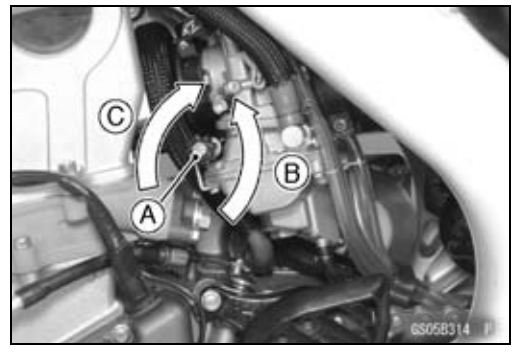


NOTE

○*When removing the pilot screw adjuster [A] from the carburetor, move the carburetor to the up lightly [B] by using the suitable tool [C].*



Periodic Maintenance Procedures



- Start the engine and warm it up thoroughly.
- Turn the idle adjusting screw [A] until the idle speed is correct.
  To increase idle speed [B]
  To decrease idle speed [C]
- Open and close the throttle a few times to make sure that the idle speed is within the specified range. Readjust if necessary.

Air Cleaner Element Cleaning and Inspection

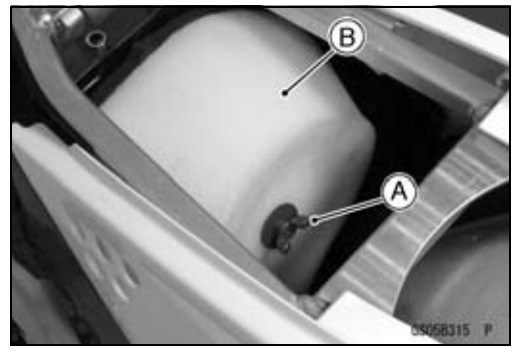
This air cleaner element should be cleaned and oiled before race or practice session. A dirty or improperly oiled element can diminish engine performance, cause spark plug fouling, and could affect long term durability of the engine. After cleaning, oil the air cleaner element using a high-quality foam-air filter oil.

NOTE

- *In dusty areas, the element should be cleaned more frequently than recommended interval.*
- *After riding through rain or on muddy roads, the element should be cleaned immediately.*
- *Since repeated cleaning opens the pores of the element, replace it with a new one in accordance with the Periodic Maintenance Chart. Also, if there is a break in the element material or any other damage to the element, replace the element with a new one.*

⚠ WARNING

Clean the element in a well-ventilated area, and take care that there are no sparks or flame anywhere near the working area; this includes any appliance with a pilot light. Because of the danger of highly flammable liquids, do not use gasoline or a low flash-point solvent to clean the element.



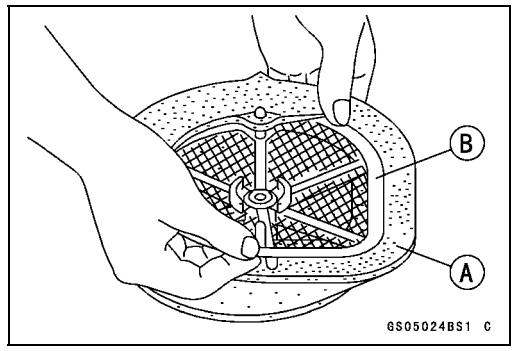
- Remove:
  Seat (see Seat Removal in the Frame chapter)
  Wing Bolt [A]
  Air Cleaner Element [B]
- Stuff a clean, lint-free towel into the carburetor so no dirt is allowed to enter the carburetor.
- Wipe out the inside of the air cleaner housing with a clean damp towel.

CAUTION

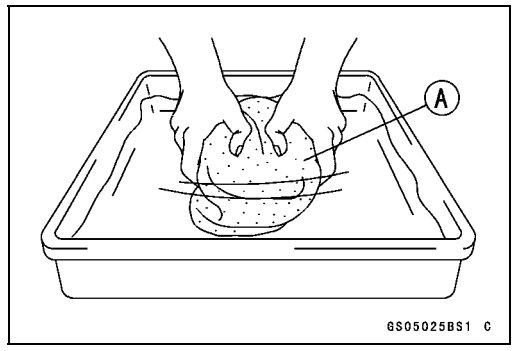
Check inside of the inlet tract and carburetor for dirt. If dirt is present, clean the intake tract and carburetor thoroughly. You may also need to replace the element and seal the housing and inlet tract.

Periodic Maintenance Procedures

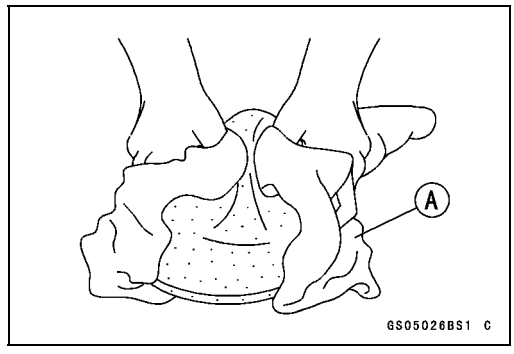
● Separate the element [A] from the frame [B].



● Clean the element [A] in a bath of a high-flash-point solvent using a soft bristle brush.

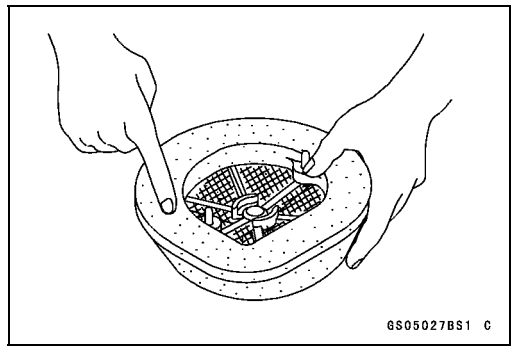


● Squeeze it dry in a clean towel [A]. Do not wring the element or blow it dry; the element can be damaged.
● Check all the parts of the element for visible damage.
★If any of the parts of the element are damaged, replace them.



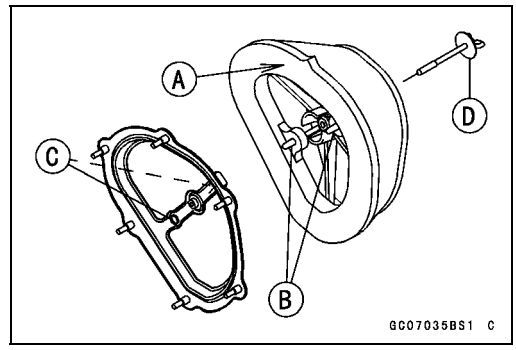
● After cleaning, saturate the element with a high-quality foam-air-filter oil, squeeze out the excess, then wrap it in a clean towel and squeeze it as dry as possible.
○Be careful not to tear the sponge filter.
● Assemble the element.
● Remove the towel from the carburetor.

● Apply grease to all connections and screw holes in the air cleaner housing and inlet tract.
● Install the element onto its frame, and coat the element lip and lip seat with a thick layer of all-purpose grease to assure a complete seal.



Periodic Maintenance Procedures

- Install the air cleaner element so that its tab [A] faces upward and its projections [B] align with the holes [C] in the frame.
- Tighten the wing bolt [D].
- Install the seat.



Fuel System Clean

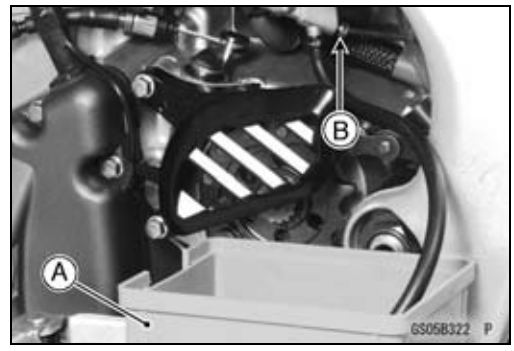
⚠ WARNING

Gasoline is extremely flammable and can be explosive under certain conditions. Always stop the engine and do not smoke. Make sure the area is well-ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.

- Turn the fuel tap to the OFF position.
- Place a suitable container [A] beneath the carburetor.
- Unscrew the drain plug [B] from the bottom of the float bowl and check for water or dirt in the fuel.

★If any water or dirt comes out, clean the carburetor, fuel tap and fuel tank.

Special Tool - Carburetor Drain Plug Wrench, Hex3: 57001 -1269



- Tighten the drain plug securely.

⚠ WARNING

Clean the fuel tank in a well-ventilated area, and take care that there is no sparks or flame anywhere near the working area. Because of the danger of highly flammable liquids, do not use gasoline or low flash-point solvent to clean the tank.

- Remove the fuel tank and drain it.
- Pour some high-flash-point solvent into the fuel tank and shake the tank to remove dirt and fuel deposits.
- Drain the solvent out of the tank.
- Remove the fuel tap from the tank by taking out the bolts.
- Clean the fuel tap filter screen in a high-flash-point solvent.
- Pour high-flash-point solvent through the tap in all lever positions.
- Dry the tank and tap with compressed air.
- Install the tap in the fuel tank.
- Install the fuel tank.

Periodic Maintenance Procedures

Cooling System

⚠ WARNING

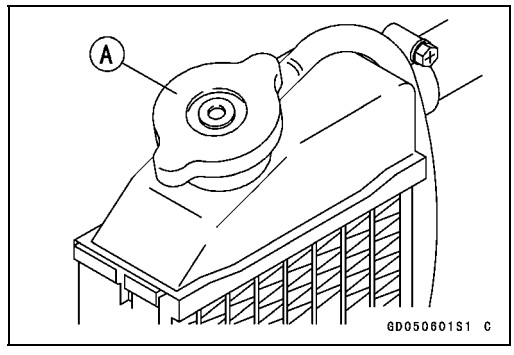
To avoid burns, do not remove the radiator cap or try to change the coolant when the engine is still hot. Wait until it cools down.
Coolant on tires will make them slippery and can cause an accident and injury. Immediately wash away any coolant that spills on the wheels.
Since coolant is harmful to the human body, do not use for drinking.

Coolant Level Inspection

NOTE

○*Check the level when the engine is cold (room or ambient temperature).*

- Lean the motorcycle slightly to the left until the radiator cap is level to the ground so that the radiator cap is located uppermost in order to exhaust the air accumulated in the radiator.
- Remove the radiator cap [A].

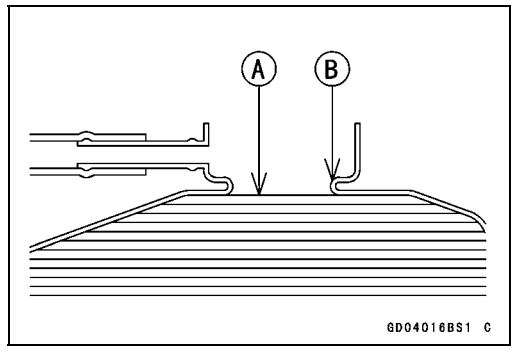


NOTE

○*Remove the radiator cap in two steps. First turn the cap counterclockwise to the first stop and wait there for a few seconds. Then push down and turn it further in the same direction and remove the cap.*

- Check the coolant level. The coolant level [A] should be at the bottom of the filler neck [B].

★If the coolant level is low, add coolant through the filler opening to the bottom of the filler neck. Install the cap.



Recommended coolant:

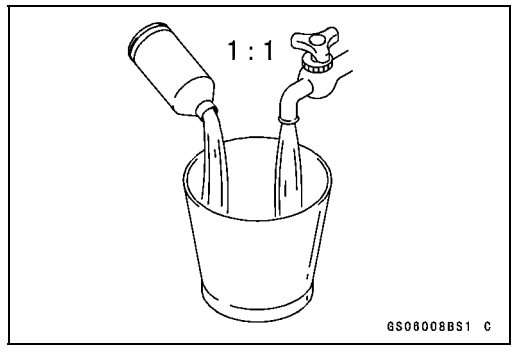
Permanent type of antifreeze (soft water and ethylene glycol plus corrosion and rust inhibitor chemicals for aluminum engines and radiators)

Water and coolant mixture ratio:

1:1 (water 50%, Coolant 50%)

Total amount:

1.10 L (1.16 US qt.)



Periodic Maintenance Procedures

CAUTION

For refilling, add the specified mixture of coolant and soft water. Adding water alone dilutes the coolant and degrades its anticorrosion properties. The diluted coolant can attack the aluminum engine parts. In an emergency, soft water alone can be added. But the diluted coolant must be returned to the correct mixture ratio within a few days.
If coolant must be added often or the reserve tank has run completely dry, there is probably leakage in the cooling system. Check the system for leaks.
Coolant ruins painted surfaces. Immediately wash away any coolant that spills on the frame, engine, wheels or other painted parts.

Coolant Deterioration Inspection

- Visually inspect the coolant.

★If whitish cotton-like wafts are observed, aluminum parts in the cooling system are corroded. If the coolant is brown, iron or steel parts are rusting. In either case, flush the cooling system.

★If the coolant gives off an abnormal smell, check for a cooling system leak. It may be caused by exhaust gas leaking into the cooling system.

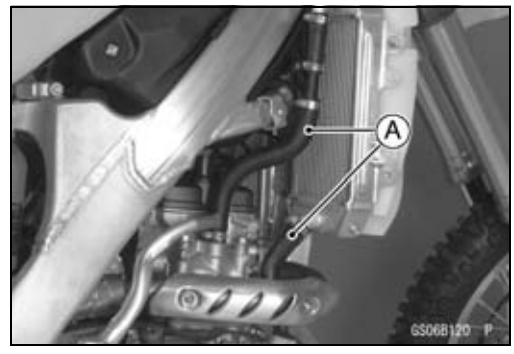
Water Hoses and Connections Inspection

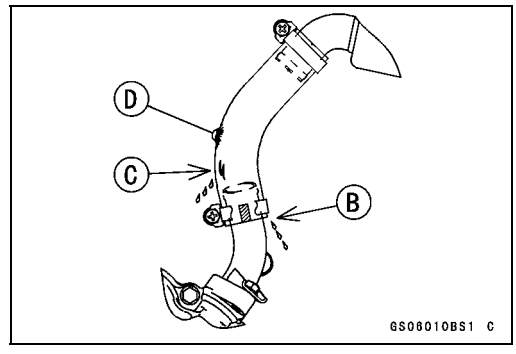
○The high pressure inside the water hoses [A] can cause coolant to leak [B] or the hose to burst if the line is not properly maintained. Visually inspect the hoses for signs of deterioration. Squeeze the hoses. A hose should not be hard and brittle, nor should it be soft or swollen.

★Replace the hose if any fraying, cracks [C] or bulges [D] are noticed.

- Check that the hoses are securely connected and clamps are tightened correctly.

Torque - Water Hose Clamp Screws: 1.5 N·m (0.15 kgf·m, 13 in·lb)





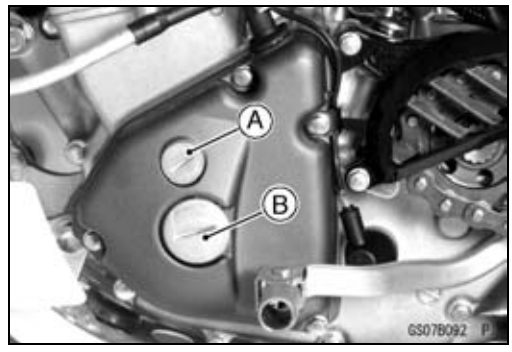
Periodic Maintenance Procedures

Engine Top End

Valve Clearance Inspection

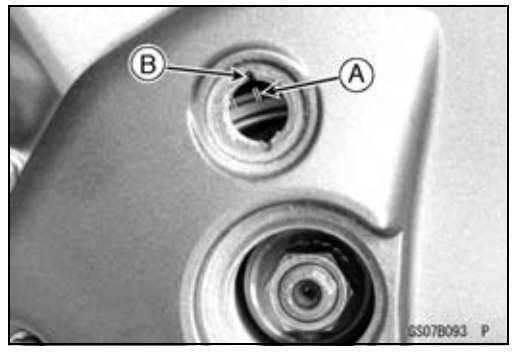
NOTE

○*Valve clearance must be checked and adjusted when the engine is cold (at room temperature).*



● Remove:
Cylinder Head Cover (see Cylinder Head Cover Removal in the Engine Top End chapter)
Timing Inspection Plug [A]
Flywheel Plug [B]

Special Tool - Filler Cap Driver: 57001-1454



● First, bring the piston to the top-dead-center (TDC) of its compression stroke to inspect the valve clearance (the position at the end of the compression stroke), when the cam lobe faces outside of the camshaft.

○Place a wrench over the flywheel nut and turn it counterclockwise to align the TDC mark [A] with the center of the groove [B] of the inspection hole.

● Using a thickness gauge [A], measure the clearance between each cam lob and valve lifter for all four valves.

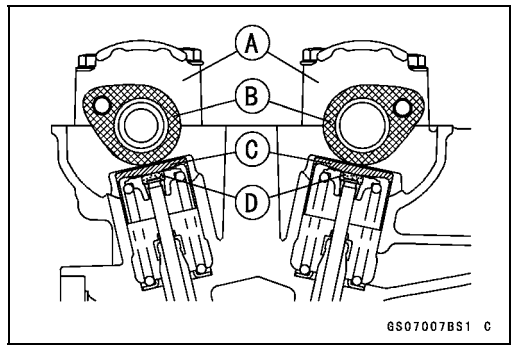
○For the purpose of adjusting the valve clearances, record the measured values.

Valve Clearance: between cam and valve lifter
Standard:

Exhaust	**0.17 ~ 0.22 mm (0.0067 ~ 0.0087 in.)**
Inlet	**0.10 ~ 0.15 mm (0.0039 ~ 0.0059 in.)**

★If the valve clearance is not within the specified range, adjust it.

Valve Clearance Adjustment

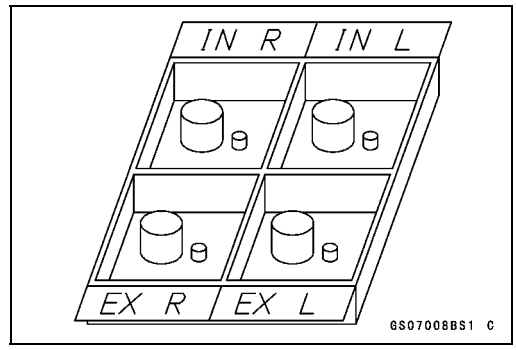


● Remove the camshaft caps [A] (see Camshaft Removal in the Engine Top End chapter).
● Remove the camshafts [B] (see Camshaft Removal in the Engine Top End chapter).
● Remove the valve lifters [C] of the applicable valve.
● Remove the shim [D] from the top of the spring retainer.

Periodic Maintenance Procedures

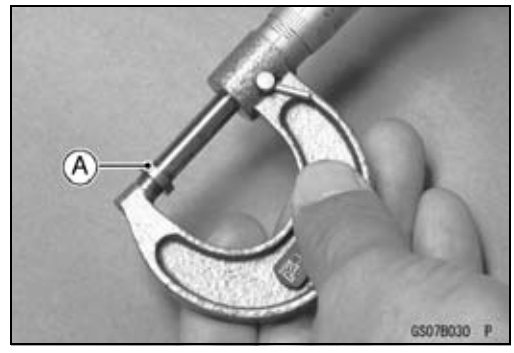
NOTE

○*Mark and record the locations of the valve lifters and shims so that they can be reinstalled in their original positions.*



- Clean the shim to remove any dust or oil.
- Measure the thickness of the removed shim [A].
- Select a new shim thickness calculation as follows.

A = (B - C) + D
[A] Replace Shim Thickness
[B] Measured Valve Clearance
[C] Specified Valve Clearance
[D] Present Shim Thickness



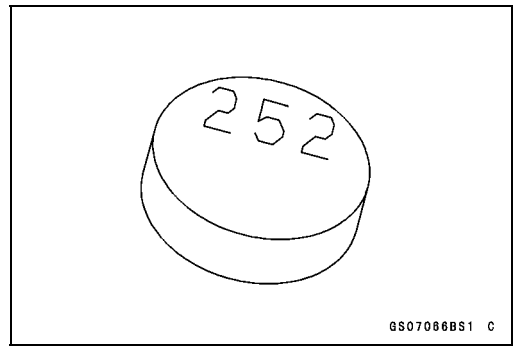
Example:

(0.31 mm - 0.10 ~ 0.15 mm) + 2.60 mm = 2.81 ~ 2.76 mm

○Exchange the shims for the 2.775 or 2.800 size shim.

CAUTION
Don't use the shims for another models. This could cause wear of the valve stem end, and valve stem damage.

Adjustment shims



Thick-ness	P/No.	Mark	Thick-ness	P/No.	Mark
2.500	92180-0167	250	3.025	92180-0188	302
2.525	92180-0168	252	3.050	92180-0189	305
2.550	92180-0169	255	3.075	92180-0190	308
2.575	92180-0170	258	3.100	92180-0191	310
2.600	92180-0171	260	3.125	92180-0192	312
2.625	92180-0172	262	3.150	92180-0193	315
2.650	92180-0173	265	3.175	92180-0194	318
2.675	92180-0174	268	3.200	92180-0195	320
2.700	92180-0175	270	3.225	92180-0196	322
2.725	92180-0176	272	3.250	92180-0197	325
2.750	92180-0177	275	3.275	92180-0198	328
2.775	92180-0178	278	3.300	92180-0199	330
2.800	92180-0179	280	3.325	92180-0200	332
2.825	92180-0180	282	3.350	92180-0201	335
2.850	92180-0181	285	3.375	92180-0202	338
2.875	92180-0182	288	3.400	92180-0203	340
2.900	92180-0183	290	3.425	92180-0204	342
2.925	92180-0184	292	3.450	92180-0205	345
2.950	92180-0185	295	3.475	92180-0206	348
2.975	92180-0186	298	3.500	92180-0207	350
3.000	92180-0187	300			

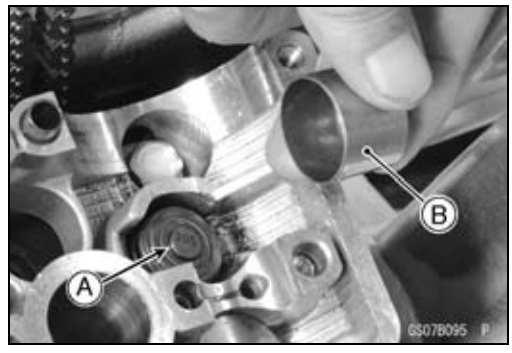
Periodic Maintenance Procedures

CAUTION

Be sure to remeasure the clearance after selecting a shim. The clearance can be out of the specified range because of the shim tolerance.

○If there is no valve clearance, use a shim that is a few sizes smaller, and remeasure the valve clearance.

- When installing the shim, face the marked side [A] toward the valve lifter [B]. At this time, apply engine oil to the shim or the valve lifter to keep the shim in place during camshaft installation.



CAUTION

Do not put shim stock under the shim. This may cause the shim to pop out at high rpm, causing extensive engine damage.
Do not grind the shim. This may cause it to fracture, causing extensive engine damage.

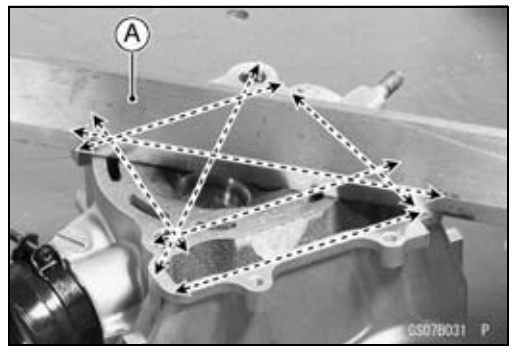
- Apply engine oil to the valve lifter surface and install the lifter.
- Install the camshaft (see Camshaft Installation in the Engine Top End chapter).
- Recheck the valve clearance and readjust if necessary.
- Install the cylinder head cover (see Cylinder Head Cover in the Engine Top End chapter), timing inspection plug, and the flywheel plug.

Torque - Timing Inspection Plug: 4 N·m (0.4 kgf·m, 35 in·lb)
Flywheel Plug: 5 N·m (0.5 kgf·m, 43 in·lb)

Cylinder Head Warp Inspection

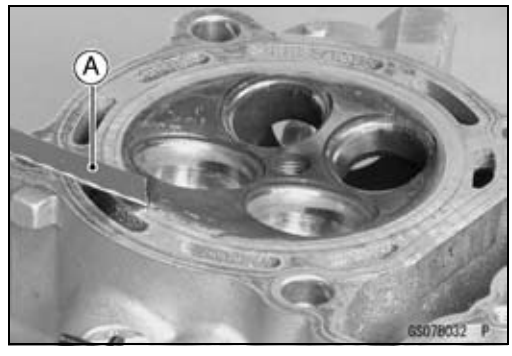
- Remove the cylinder head (see Cylinder Head Removal in the Engine Top End chapter).
- Lay a straightedge [A] across the lower surface of the head at several different points, and measure warp by inserting a thickness gauge between the straightedge and the head.

★If warp exceeds the service limit, repair the mating surface. Replace the cylinder head if the mating surface is badly damaged.



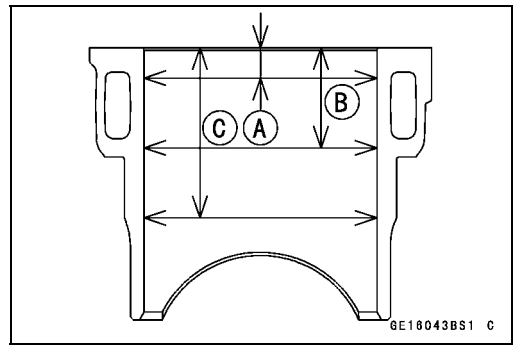
Cylinder Head Warp
Service Limit: 0.05 mm (0.0020 in.)

- Remove the valves (see Valve Removal in the Engine Top End chapter).
- Scrape the carbon out of the combustion chamber and exhaust port with a scraper [A] or a suitable tool.
- Clean the cylinder head, using high-flash point solvent.
- Blow out any particles which may obstruct the oil passage in the cylinder head using compressed air.
- Install the valves (see Valve Installation in the Engine Top End chapter).



Periodic Maintenance Procedures

Cylinder Wear Inspection



NOTE

○*Measure the cylinder inside diameter when the cylinder is cold (room or ambient temperature).*

- Visually Inspect the inside of the cylinder for scratches and abnormal wear.

★If the cylinder is damaged or badly worn, replace it with a new one.

- Since there is a difference in cylinder wear in different directions, take a side-to-side and a front-to back measurement shown in the figure.

★If any of the cylinder inside diameter measurements exceeds the service limit, the cylinder must be replaced with a new one since the PLATING cylinder cannot be bored or honed.

(A): 10 mm (0.39 in.)

(B): 25 mm (0.98 in.)

(C): 60 mm (2.36 in.)

Cylinder Inside Diameter

Standard	**77.000 ~ 77.012 mm (3.0315 ~ 3.0320 in.), and less than 0.01 mm (0.0004 in.) difference between any two measurements.**
Service Limit	**77.06 mm (3.0339 in.), or more than 0.05 mm (0.020 in.) difference between any two measurements.**

Piston/Cylinder Clearance Inspection

The piston-to-cylinder clearance is measured whenever a piston or cylinder is replaced with a new one. The standard piston-to-cylinder clearance must be adhered to whenever the cylinder is replaced.

If only a piston is replaced, the clearance may exceed the standard slightly. But it must not be less than the minimum, in order to avoid piston seizure.

The most accurate way to find the piston clearance is by making separate piston and cylinder diameter measurements and then computing the difference between the two values. Measure the piston diameter as just described, and measure the cylinder diameter at the very bottom of the cylinder.

Piston/Cylinder Clearance

Standard: 0.030 ~ 0.057 mm (0.0012 ~ 0.0022 in.)

Piston, Piston Ring and Piston Pin Replacement

- Refer to the Cylinder Section in the Engine Top End chapter.

Periodic Maintenance Procedures

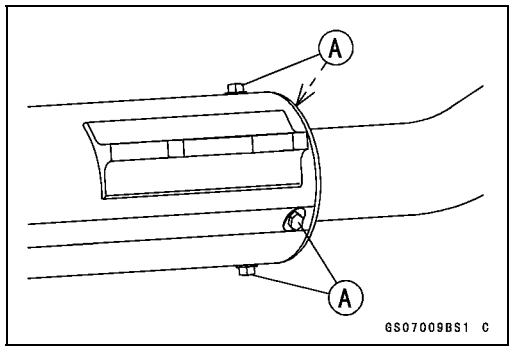
Exhaust System Inspection

- The exhaust system, in particular the muffler body, is designed to reduce exhaust noise and conduct the exhaust gases away from the rider while minimizing power loss. If carbon has built up inside the muffler body, exhaust efficiency is reduced, causing engine performance to drop.

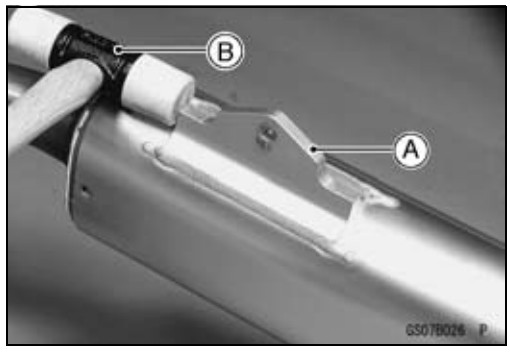
★If the muffler body is badly damaged, dented, cracked or rusted, replace it. Replace the muffler baffle if the exhaust noise becomes too loud or engine performance drops.

Muffler Baffle Change

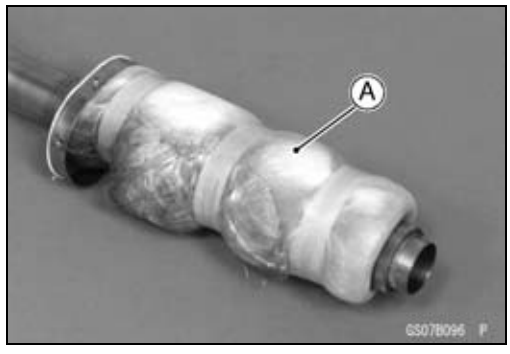
- Remove the muffler (see Muffler Removal in the Engine Top End chapter).
- Remove the muffler pipe mounting bolts [A].



- Tap the bracket [A] of the muffler body with a plastic mallet [B] to separate from the silencer pipe.



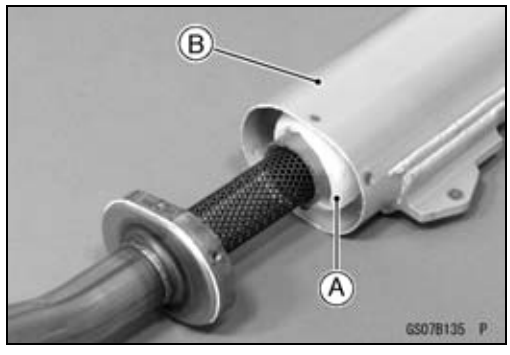
- Pull off the old muffler baffle assembly [A].



- Install the new muffler baffle assembly [A] into the muffler body [B].

NOTE

○*When replacing the muffler baffle assembly, first insert the muffler baffle assembly into the muffler body, and align the exhaust hole of the muffler body with the muffler baffle assembly hole while turning the muffler baffle assembly. Then, install the inner pipe by pushing the inner pipe into the muffler body with aligning the inner pipe with the exhaust hole.*

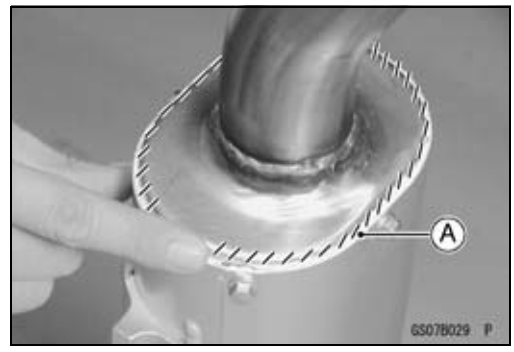


Periodic Maintenance Procedures

- Apply a non-permanent locking agent to the muffler pipe mounting bolts.
- Tighten the muffler pipe mounting bolts with specified torque.

Torque - Muffler Pipe Mounting Bolts: 12 N·m (1.2 kgf·m, 104 in·lb)

- Apply silicone sealant to the circumference [A] of the inner pipe.
- Install the muffler (see Muffler Installation in the Engine Top End chapter).



Engine Right Side

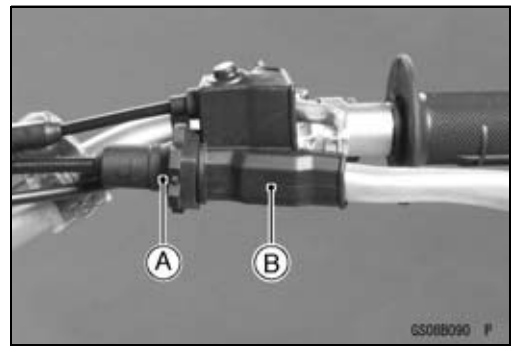
⚠ WARNING

To avoid a serious burn, never touch the hot engine or exhaust chamber during clutch adjustment.

Clutch Inspection

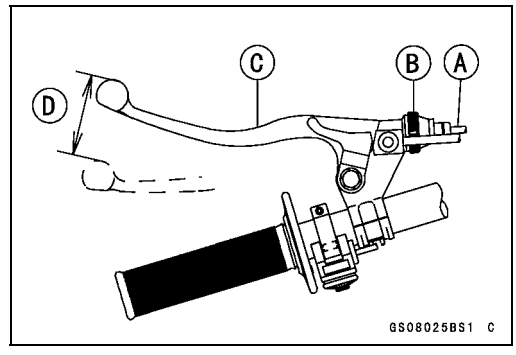
Clutch Lever (Clutch Cable) Free Play Inspection

- Slide the clutch cable adjuster dust cover [A] and lever dust cover [B] out of place.



- Check that the clutch cable upper end is fully seated [A] in the adjuster [B].
- Check that the clutch lever [C] has 8 ~ 13 mm (0.3 ~ 0.5 in.) of play [D]

★If the play is too wide, the clutch may not release fully. If the play is too narrow, the clutch may not engage fully. In either case, adjust it.



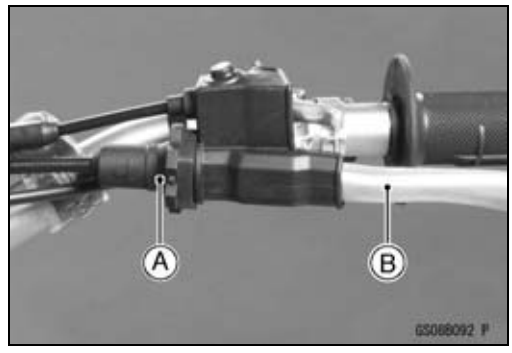
Periodic Maintenance Procedures

Clutch Lever (Clutch Cable) Free Play Adjustment

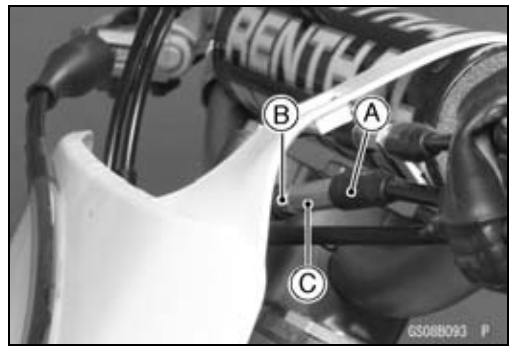
- Turn the adjuster [A] so that the clutch lever [B] will have 8 ~ 13 mm (0.3 ~ 0.5 in.) of play.

NOTE

○*Be sure that the outer cable end at the clutch lever is fully seated in the adjuster at the clutch lever, or it could slip into the place later, creating enough cable play to prevent clutch disengagement.*



- If it cannot be done.
- Slide the adjuster cover [A] back.
- If it cannot be done, loosen the locknut [B] at the upper of the clutch cable, and turn the adjusting nut [C] so that clutch lever has 8 ~ 13 mm (0.3 ~ 0.5 in.) of play.
- After the adjustment is made, tighten the locknut, and start the engine and check that the clutch does not slip and that it release properly.



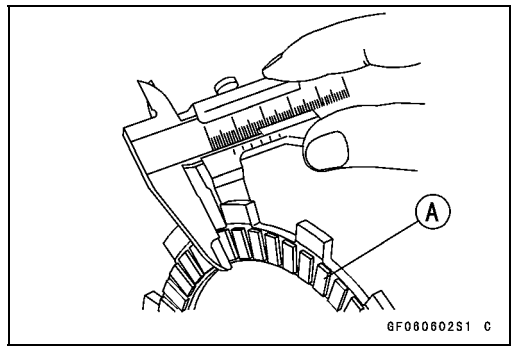
Clutch Plates Inspection

- Remove the clutch plates (see Clutch Removal in the Engine Right Side chapter)
- Visually inspect the friction and steel plates to see if they show any signs of seizure, or uneven wear.

★If any plates show signs of damage, replace the friction plates and steel plates as a set.

- Measure the thickness [A] of the friction and steel plates with vernier calipers.

★If they have worn past the service limit, replace them with new ones.



Friction Plate Thickness

Standard: 2.7 ~ 2.9 mm (0.106 ~ 0.114 in.)

Service Limit: 2.6 mm (0.102 in.)

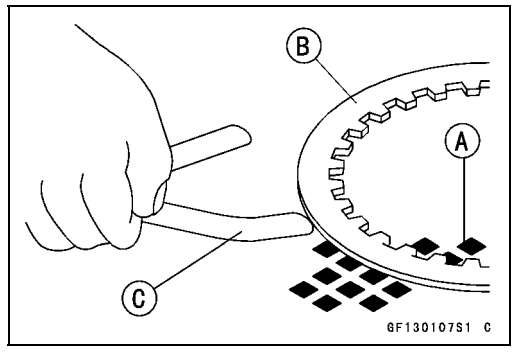
Steel Plate Thickness

Standard: 1.5 ~ 1.7 mm (0.059 ~ 0.067 in.)

Service Limit: 1.4 mm (0.055 in.)

- Place each friction plate or steel plate on a surface plate, and measure the gap between the surface plate [A] and each friction plate or steel plate [B] with a thickness gauge [C]. The gap is the amount of friction or steel plate warp.

★If any plate is warped over the service limit, replace it with a new one.



Friction and Steel Plates Warp

Standard:

Friction Plate 0.15 mm (0.006 in.) or less

Steel Plate 0.15 mm (0.006 in.)or less

Service Limit:

Friction Plate 0.3 mm (0.012 in.)

Steel Plate 0.3 mm (0.012 in.)

Periodic Maintenance Procedures

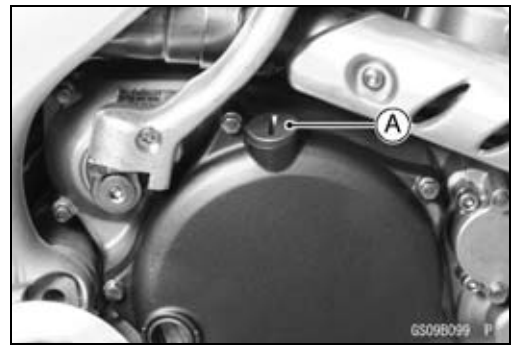
Engine Lubrication System

⚠ WARNING

Motorcycle operation with insufficient, deteriorated, or contaminated engine oil will cause accelerated wear and may result in engine or transmission seizure, and injury.

Engine Oil Change

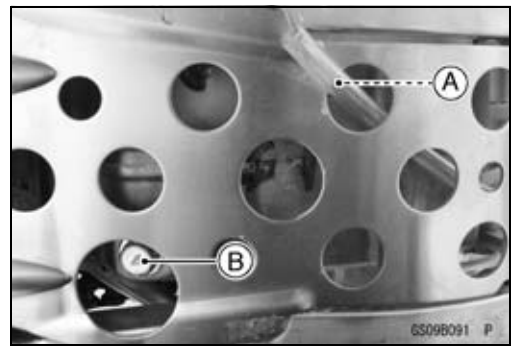
- Warm up the engine thoroughly so that the oil will pick up any sediment and drain easily. Then stop the engine.
- Place an oil pan beneath the engine.
- Remove the oil filler plug [A].



- Remove the engine oil drain plugs from the bottom of the engine, and let the oil drain completely.
  Drain Plug (for crank room oil sump) [A]
  Drain Plug (for transmission oil sump) [B]

NOTE

○*Hold the motorcycle upright so that the oil may drain completely.*



- Replace the gaskets at the drain plugs with a new one.
- After the oil has completely drained out, install the drain plugs with the gaskets, and tighten them.

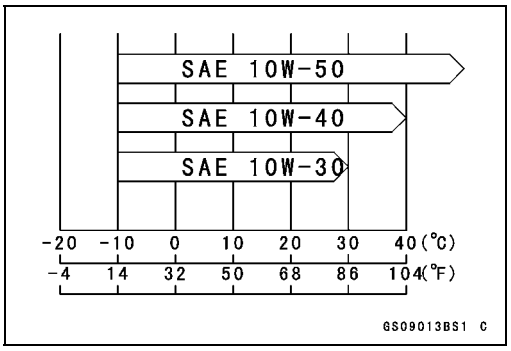
Torque - Engine Oil Drain Bolts
Crank Room Oil Sump: 7.0 N·m (0.7 kgf·m, 61 in·lb)
Transmission Oil Sump: 20 N·m (2.0 kgf·m, 14.5 ft·lb)

- Fill the engine with a good quality engine oil specified below.

Periodic Maintenance Procedures

Recommended Engine Oil

Grade	**Castrol "R4 Superbike" 5W-40 (KX250T6F ~ T7F),**
	Castrol "POWER1 R4 Racing" 5W-40 (KX250T8F) or
	API SG, SH, SJ or SL with JASO MA
Viscosity	**SAE 10W-30, 10W-40, 10W-50**
Capacity	**1.3 L (1.4 US qt.) (when filter is not removed)**
	1.35 L (1.43 US qt.) (when filter is remove)
	1.5 L (1.6 US qt.) (when engine is completely dry)



Torque - Oil Filler Plug: 5.0 N·m (0.51 kgf·m, 44 in·lb)

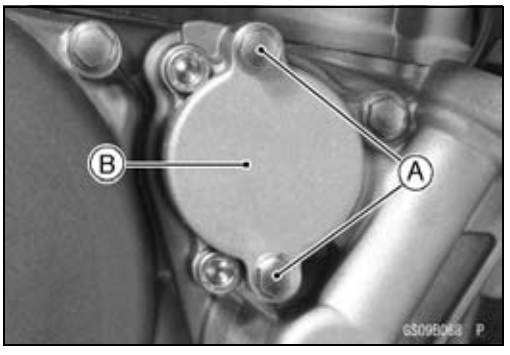
NOTE

○*The oil viscosity may need to be changed to accommodate atmospheric conditions in your riding area.*

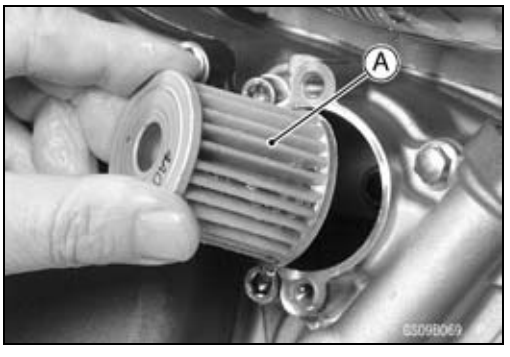
- Check the oil level (see Oil Level Inspection in the Engine Lubrication System chapter).

Oil Filter Change

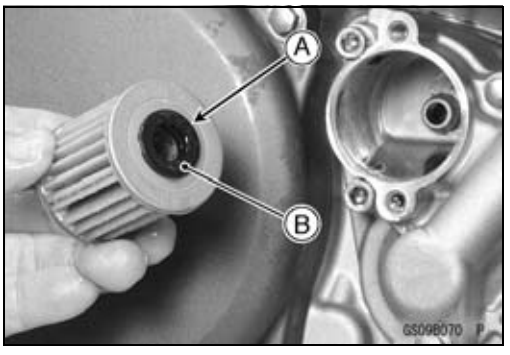
- Drain:
  Engine Oil (see Engine Oil Change)
- Remove:
  Oil Filter Cap Bolt [A]
  Oil Filter Cap [B]



- Remove the Oil Filter [A].



- Replace the oil filter with a new one.
- Apply grease [A] to the grommet.
- Be sure to install the filter with the grommet [B] facing inside as shown.



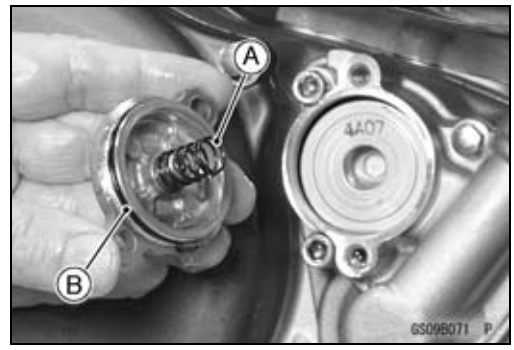
CAUTION
Inside out installation stop oil flow, causing engine seizure.

Periodic Maintenance Procedures

- Install the spring [A].
- Replace the oil filter cap O-ring [B] with a new one.
- Apply grease to the O-ring.
- Install the oil filter cap.

Torque - Oil Filter Cap Bolt: 9.8 N·m (1.0 kgf·m, 87 in·lb)

- Pour in the specified type and amount of oil (see Engine Oil Change).



Breather Hose Inspection

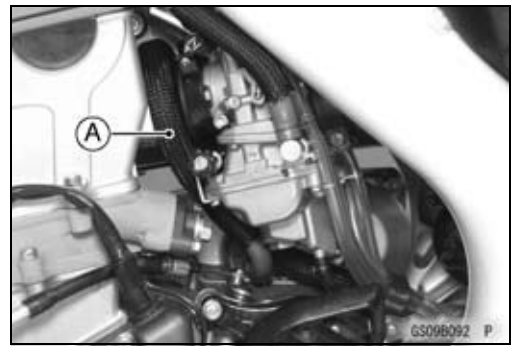
- Be certain that the breather hose are routed without being flattened or kinked and is connected correctly.

★If it is not, correct it.

- Inspect the breather hose [A] for damage or sings of deterioration.

○This hose should not be hard and brittle, nor should be soft swollen.

★Replace it if any cracks or swelling is noticed.



Crankshaft/Transmission

Crankshaft Inspection

- Remove the cylinder head (see Cylinder Head Removal in the Engine Top End chapter).
- Remove the cylinder (see Cylinder Removal in the Engine Top End chapter).
- Remove the piston (see Piston Removal in the Engine Top End chapter).
- Make sure that the crankshaft rotate smoothy (in the neutral position).

★If the crankshaft will not turn smoothly, check the cranks shaft assembly and bearings.

Connecting Rod Big End Side Clearance

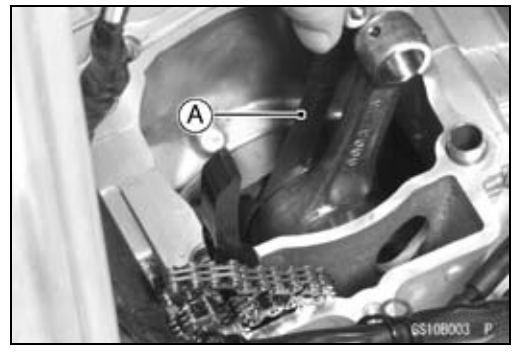
- Measure the connecting rod big end side clearance at right side of big end using a thickness gauge [A].

Connecting Rod Big End Side Clearance

Standard:	**0.25 ~ 0.35 mm (0.0098 ~ 0.0138 in.)**
Service Limit:	**0.55 mm (0.0217 in.)**

★If the clearance exceeds the service limit, replace the crankshaft assembly or reassemble the crankshaft assembly.

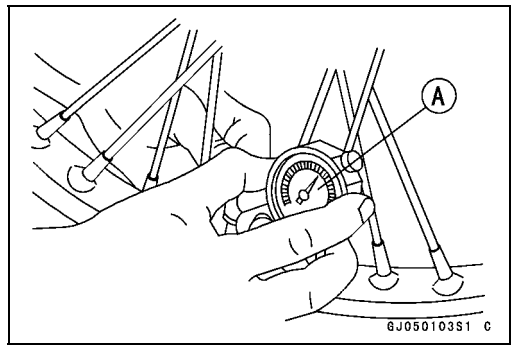
- Make sure that the crankshaft rotates smoothly after assembling the engine.



Periodic Maintenance Procedures

Wheel/Tires

Air Pressure Inspection/Adjustment

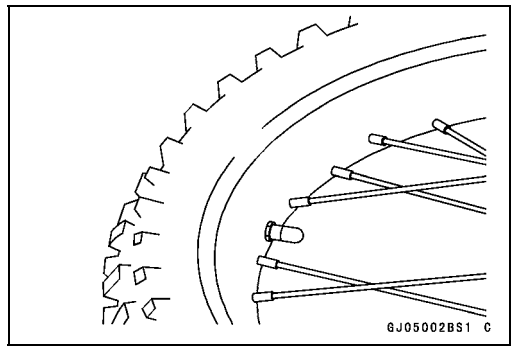


- Using tire air pressure gauge [A], measure the tire pressure when the tires are cold.

★Adjust the tire air pressure to suit track conditions and rider preference, but do not stray too far from the recommended pressure.

Track Condition	Tire Pressure
When the track is wet, muddy, sandy or slippery, reduce the tire pressure to increase the tire tread surface on the ground.	80 kPa (0.8 kgf/cm², 11 psi) ↑
When the track is pebbly or hard, increase the tire pressure to prevent damage or punctures, through the tires will skid more easily.	↓ 100 kPa (1.0 kgf/cm², 14 psi)

Tires Inspection



As the tire tread wears down, the tire becomes more susceptible the puncture and failure.

- Remove any imbedded stones or other foreign particles from the tread.
- Visually inspect the tire for cracks and cuts, replacing the tire in case of bad damage. Swelling or high spots indicate internal damage, requiring tire replacement.

⚠ WARNING

To ensure safe handling and stability, use only the recommended standard tires for replacement, inflated to the standard pressure.

NOTE

○*Check and balance the wheel when a tire is replaced with a new one.*

Standard Tire

Front:

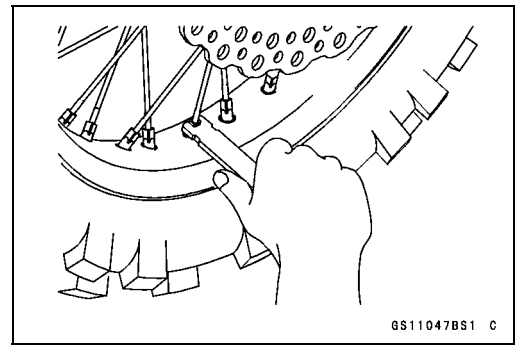
Size:	**80/100-21 51M**
Make:	**BRIDESTONE**
Type:	**M401, Tube (KX250T6F ~ T7F)** **M403, Tube (KX250T8F)** **(EUR) M201, Tube**

Rear:

Size:	**100/90-19 57M**
Make:	**BRIDESTONE**
Type:	**M402, Tube (KX250T6F ~ T7F)** **M404, Tube (KX250T8F)** **(EUR) M202, Tube**

Periodic Maintenance Procedures

Spoke Tightness Inspection



- Check that all the spokes are tightened evenly.

★If spoke tightness is uneven or loose, tighten the spoke nipples evenly.

Torque - Spoke Nipples: 2.2 N·m (0.22 kgf·m, 19 in·lb)

- Check the rim runout.

⚠ WARNING

If any spoke breaks, it should be replaced immediately. A missing spoke places an additional load on the other spokes, which will eventually cause other spokes to break.

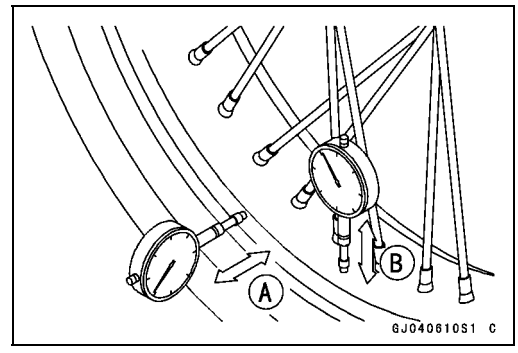
Rim Runout Inspection

- Place the jack under the frame so that the front/rear wheel off the ground.

Special Tools - Jack: 57001-1238
Jack Attachment: 57001-1252 or 57001 -1608

- Inspect the rim for small cracks, dents, bending, or warping.

★If there is any damage to the rim, it must be replaced.



- Set a dial gauge against the side of the rim, and rotate the rim to measure the axial runout [A]. The difference between the highest and lowest dial readings is the amount of runout.
- Set a dial gauge against the outer circumference of the rim, and rotate the rim to measure radial runout [B]. The difference between the highest and lowest dial readings is the amount of runout.

★If rim runout exceeds the service limit, check the wheel bearings first. Replace them if they are damaged. If the problem is not due to the bearings, correct the rim warp (runout). A certain amount of rim warp can be corrected by recentering the rim. Loosen some spokes and tighten others within the standard torque to change the position of different parts of the rim. If the rim is badly bent, however, it must be replaced.

Rim Runout (with tire installed)

Standard:	
Axial	**TIR 1.0 mm (0.04 in.) or less**
Radial	**TIR 1.0 mm (0.04 in.) or less**
Service Limit:	
Axial	**TIR 2 mm (0.08 in.)**
Radial	**TIR 2 mm (0.08 in.)**

Periodic Maintenance Procedures

Wheel Bearing Inspection

- Raise the front/rear wheel off the ground.

Special Tools - Jack: 57001-1238
Jack Attachment: 57001-1252 or 57001 -1608

- Spin the wheel lightly, and check for roughness, binding or noise.

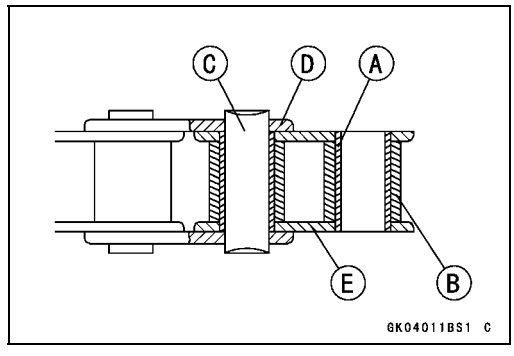
★If roughness, binding, abnormal noise is found, replace the hub bearing.

- Turn the handlebar until the handlebar doesn't move to either side.
- The wheel edge is moved to one direction gripping the edge of the wheel by both hands and the play of the wheel bearing is checked.

★If the play is found, replace the bearing.

Final Drive

Drive Chain Wear Inspection

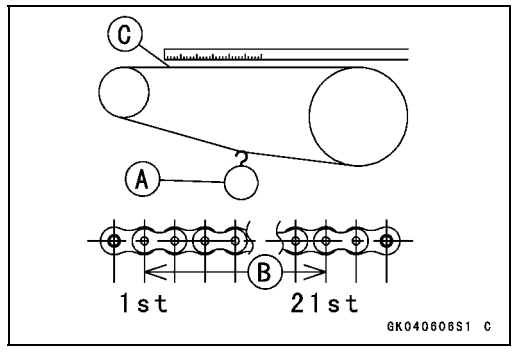


- Rotate the rear wheel to inspect the drive chain for damaged rollers, and loose pins and links.

★If there is any irregularity, replace the drive chain.

★Lubricate the drive chain if it appears dry.

[A] Bushing
[B] Roller
[C] Pin
[D] Pin Link
[E] Roller Link



- Stretch the chain taut by hanging a 98 N (10 kgf, 20 lb) weight [A] on the chain.
- Measure the length of 20 links [B] on the straight part [C] of the chain from the pin center of the 1st pin to the pin center of the 21st pin. Since the chain may wear unevenly, take measurements at several places.

Chain 20-link Length

Standard:	**317.5 ~ 318.2 mm (12.50 ~ 12.53 in.)**
Service Limit:	**323 mm (12.72 in.)**

★If any measurements exceed the service limit, replace the chain. Also, replace the front and rear sprockets when the drive chain is replaced.

Periodic Maintenance Procedures

⚠ WARNING

If the drive chain wear exceeds the service limit, replace the chain or an unsafe riding condition may result. A chain that breaks or jumps off the sprockets could snag on the engine sprocket or lock the rear wheel, severely damaging the motorcycle and causing it to go out of control.

Standard Chain

Make: **DAIDO**

Type: **D.I.D 520DMA2**

Link: **112 Links**

Drive Chain Slack Inspection

- Raise the rear wheel off the ground, rotate the rear wheel to find the place where the chain is tightest (because it wears unevenly).
- Check the wheel alignment (see Wheel Alignment Inspection in the Wheels chapter), and adjust it if necessary (see Wheel Alignment Adjustment in the Wheels chapter).

NOTE

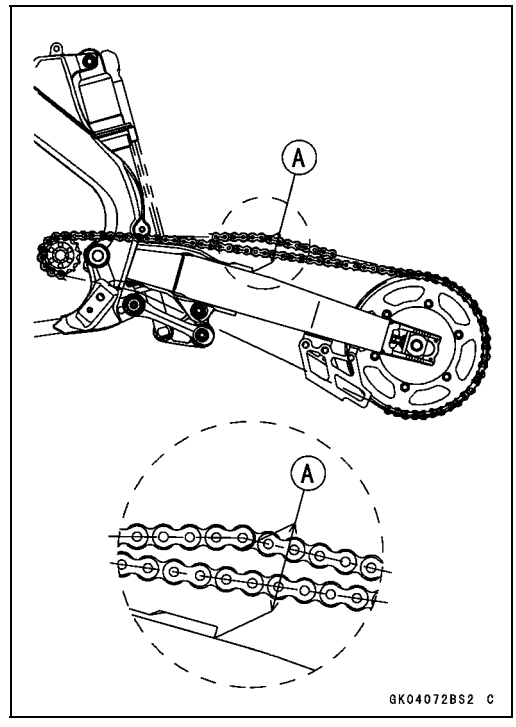
○*Clean the drive chain if it is dirty, and lubricate it if it appears dry.*

- Rotate the rear wheel to find the position where the chain is tightest.
- Measure the space (chain slack) [A] between the chain and the swingarm at the rear of the chain slipper as shown.

★If the drive chain slack exceeds the standard, adjust it.

Chain Slack

Standard: **52 ~ 58 mm (2.05 ~ 2.28 in.)**



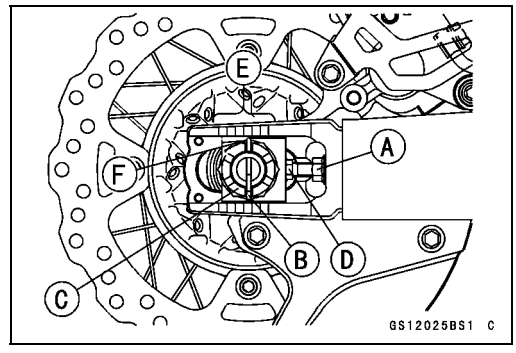
Drive Chain Slack Adjustment

- Loosen the left and right chain adjuster locknuts [A].
- Remove the cotter pin [B] and loosen the axle nut [C].

★If the chain is too tight, back out the left and right chain adjusting bolts [D] evenly, and push the wheel forward until the chain is too loose.

★If the chain is too loose, turn both chain adjusting bolts evenly until the drive chain has the correct amount of slack. To keep the chain and wheel properly aligned, the notch on the left chain adjuster should align with the same swingarm mark [E] as the right chain adjuster notch [F].

★Check the wheel alignment.



⚠ WARNING

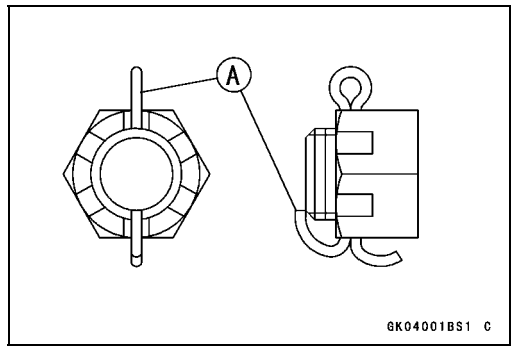
Misalignment of the wheel result in abnormal wear and may result in an unsafe riding condition.

Periodic Maintenance Procedures

- Tighten both chain adjuster locknuts securely.
- Tighten the axle nut.

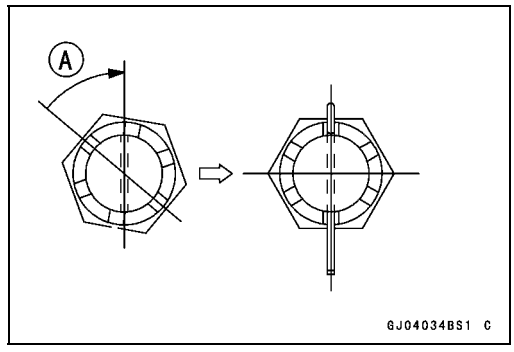
Torque - Rear Axle Nut: 108 N·m (11 kgf·m, 80 ft·lb)

- Rotate the wheel, measure the chain slack again at the tightest position, and readjust if necessary.
- Install a new cotter pin [A] through the axle nut and axle, and spread its ends.



NOTE

○*When inserting the cotter pin, if the slots in the nut do not align with the cotter pin hole in the axle shaft, tighten the nut clockwise [A] up to next alignment.*
○*It should be within 30 degree.*
○*Loosen one and tighten again when the slot goes past the nearest hole.*



⚠ WARNING

If the axle nut is not securely tightened, or the cotter pin is not installed, an unsafe riding condition may result.

- Check the rear brake (see Brakes chapter).

NOTE

○*In wet and muddy conditions, mud sticks to the chain and sprockets resulting in an overly tight chain, and the chain may break. To prevent this, adjust the chain to 58 ~ 68 mm (2.28 ~ 2.68 in.) of slack whenever necessary.*

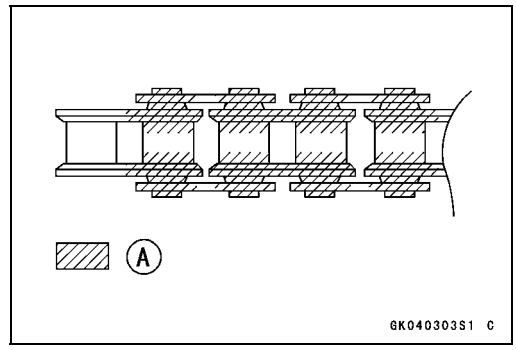
Drive Chain Lubrication

○The chain should be lubricated with a lubricant which will both prevent the exterior from rusting and also absorb shock and reduce friction in the interior of the chain.
★If the chain is especially dirty, it should be washed in diesel oil or kerosene, and afterward soaked in a heavy oil. Shake the chain while it is in the oil so that oil will penetrate into the inside of each roller.
- An effective, good quality lubricant specially formulated for chains is best for regular chain lubrication.

Periodic Maintenance Procedures

- If a special lubricant is not available, a heavy oil such as SAE90 is preferred to a lighter oil because it will stay on the chain longer and provide better lubrication.
- Apply oil to the sides of the rollers so that oil will penetrate into the rollers and bushings.
- Wipe off any excess oil.

  Oil applied area [A]

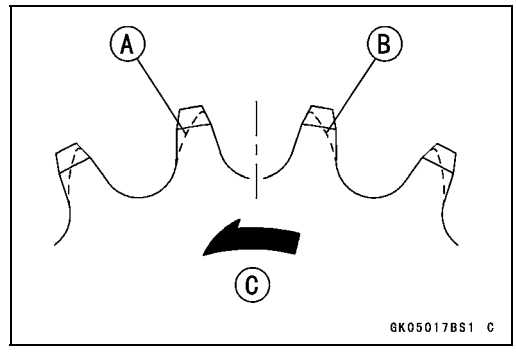


Sprocket Wear Inspection

- Visually inspect the front and rear sprocket teeth for wear and damage.

★If they are worn as illustrated or damaged, replace the sprocket.

[A] Worn Tooth (Engine Sprocket)
[B] Worn Tooth (Rear Sprocket)
[C] Direction of Rotation



NOTE

○*If a sprocket requires replacement, the chain is probably worn also. When replacing a sprocket, inspect the chain.*

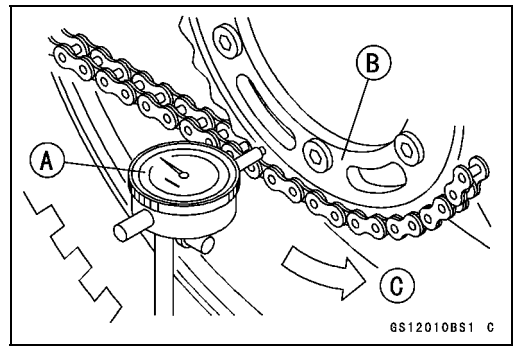
Rear Sprocket Warp (Runout) Inspection

- Using the jack, raise the rear wheel off the ground.

Special Tools - Jack: 57001-1238
Jake Attachment: 57001-1252 or 57001 -1608

- Set a dial gauge [A] against the rear sprocket [B] near the teeth as shown and rotate [C] the rear wheel to measure the sprocket runout (warp). The difference between the highest and lowest dial gauge readings is the amount of runout (warp).

★If the runout exceeds the service limit, replace the rear sprocket.



Rear Sprocket Warp (Runout)

Standard:	**TIR 0.4 mm (0.016 in.) or less**
Service Limit:	**TIR 0.5 mm (0.020 in.)**

Brakes

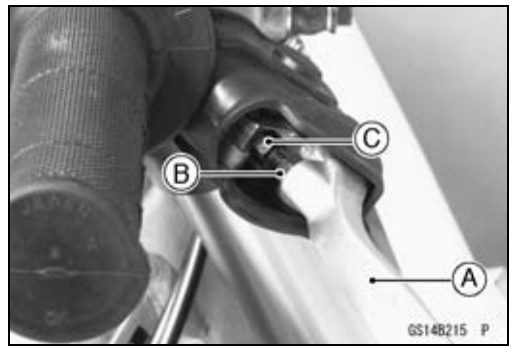
Brake Lever and Pedal Adjustment

⚠ WARNING

Always maintain proper brake adjustment. If adjustment is improper, the brake could drag and overheat. This could damage the brake assembly and possibly lock the wheel resulting in loss of control.

Periodic Maintenance Procedures

- Adjust the front brake lever [A] to suit you.
- Loosen the adjuster locknut [B] and turn the adjuster [C] to either side.
- After adjustment, tighten the locknut.



NOTE

○*Usually it is not necessary to adjust the pedal position, but always adjust it when the master cylinder is disassembled or pedal position is incorrect.*

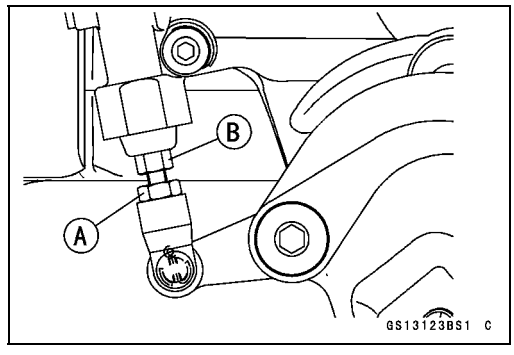
- Measure the length indicated in the figure.

Length [A]
Standard: 68.5 ±1 mm (3.09 ±0.04 in.)

★If it is not specified length, the brake pedal may be deformed or incorrectly installed.
★If it is not within the specified length, adjust the push rod in the master cylinder as follows.

○Loosen the push rod locknut [A].
○Turn the adjusting bolt [B] to obtain the specified length.
○Tighten the locknut.

Torque - Rear Master Cylinder Push Rod Locknut: 17 N·m (1.7 kgf·m, 12.5 ft·lb)



Periodic Maintenance Procedures

Brake Fluid Level Inspection

● Check the brake fluid level in the front or rear brake reservoir [A].

NOTE

○*Hold the reservoir horizontal when checking brake fluid level.*

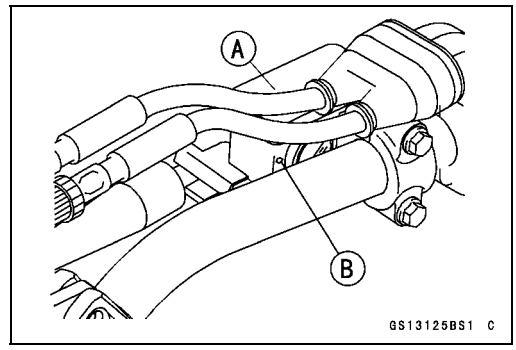
● The front or rear reservoir must be kept above the lower level line [B].

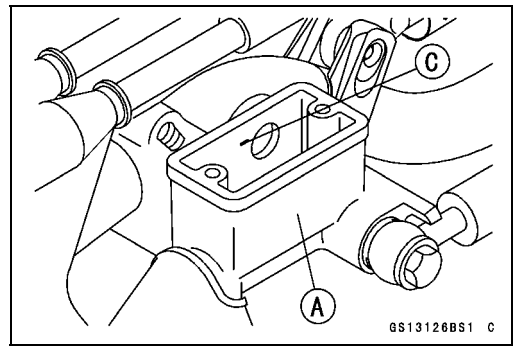
○If the fluid level in front or rear reservoir is lower than the lower level line, fill the reservoir to the upper level line. Inside the reservoir is stopped end showing the upper level line [C].

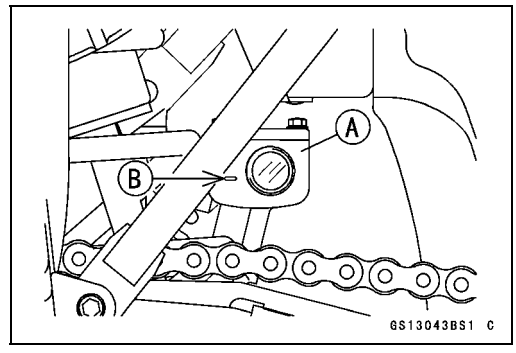
Torque - Brake Reservoir Cap Screws: 1.5 N·m (0.15 kgf·m, 13 in·lb)

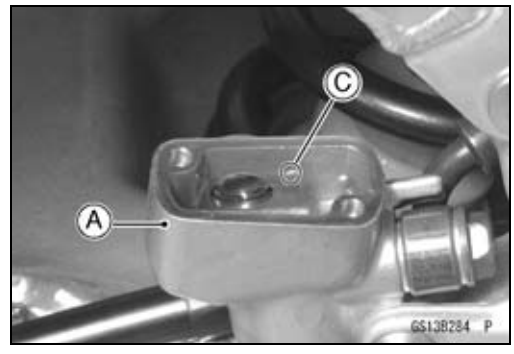
⚠ WARNING

Do not mix two brands of fluid. Change the brake fluid in the brake line completely if the brake fluid must be refilled but the type and brand of the brake fluid that is already in the reservoir are unidentified. After changing the fluid, use only the same type and brand of fluid thereafter.









Periodic Maintenance Procedures

Brake Fluid Change

In accordance with the Periodic Maintenance Chart, change the brake fluid. The brake fluid should also be changed if it becomes contaminated with dirt or water. Furthermore, the brake fluid should be changed to bleed the air quickly and completely whenever the brake line parts are removed.

⚠ WARNING

When working with the disc brake, observe the precautions listed below.

1. Never reuse old brake fluid.
2. Do not use fluid from a container that has been left unsealed or that has been open for a long time.
3. Do not mix two types and brands of fluid for use in the brake. This lowers the brake fluid boiling point and could cause the brake to be ineffective. It may also cause the rubber brake parts to deteriorate.
4. Don't leave the reservoir cap off for any length of time to avoid moisture contamination of the fluid.
5. Don't change the fluid in the rain or when a strong wind is blowing.
6. Except for the disc pads and disc, use only disc brake fluid, isopropyl alcohol, or ethyl alcohol for cleaning brake parts. Do not use any other fluid for cleaning these parts. Gasoline, engine oil, or any other petroleum distillate will cause deterioration of the rubber parts. Oil spilled on any part will be difficult to wash off completely and will eventually deteriorate the rubber used in the disc brake.
7. When handing the disc pads or disc, be careful that no disc brake fluid or any oil gets on them. Clean off any fluid or oil that inadvertently gets on the pads or disc with a high-flash point solvent. Do not use one which will leave an oily residue. Replace the pads with new ones if they cannot be cleaned satisfactorily.
8. Brake fluid quickly ruins painted surfaces; any spilled fluid should be completely wiped up immediately.
9. If any of the brake line fittings or the bleed valve is opened at any time, the **AIR MUST BE BLED FROM THE BRAKE LINE**.

Recommended Disc Brake Fluid Type:

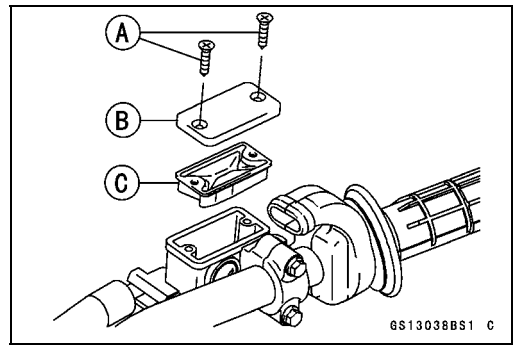
Front	**DOT3 or DOT4**
Rear	**DOT4**

Periodic Maintenance Procedures

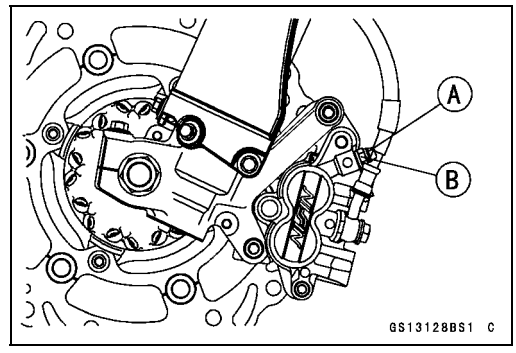
NOTE

○*The procedure to change the front brake fluid is as follows. Changing the rear brake fluid is the same as for the front brake.*

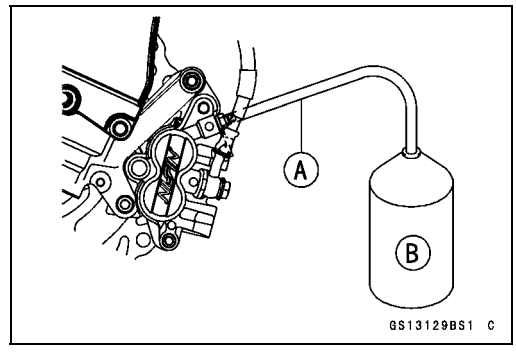
● Level the brake fluid reservoir.
● Remove the screw [A], reservoir cap [B] and diaphragm [C].



● Remove the rubber cap [A] on the bleed valve [B].



● Attach a clear plastic hose [A] to the bleed valve on the caliper, and run the other end of the hose into a container [B].



● Change the brake fluid as follows:
○Repeat this operation until fresh brake fluid comes out from the plastic hose or the color of the fluid changes.
1. Open the bleed valve [A]
2. Apply the brake and hold it [B]
3. Close the bleed valve [C]
4. Release the brake [D]

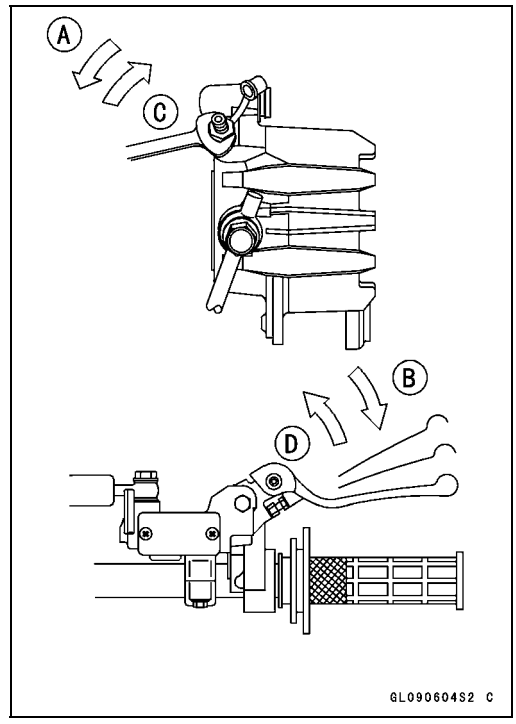
○Fill the reservoir with fresh specified brake fluid.

⚠ WARNING

Do not mix two brands of fluid. Change the brake fluid in the brake line completely if the brake fluid must be refilled but the type and brand of the brake fluid that is already in the reservoir are unidentified.

NOTE

○*The fluid level must be checked often during the changing operation and replenished with fresh brake fluid. If the fluid in the reservoir runs out any time during the changing operation, the brakes will need to be bled since air will have entered the brake line.*



Periodic Maintenance Procedures

- Remove the clear plastic hose.
- Tighten the bleed valves, and install the rubber caps.

Torque - Caliper Bleed Valve: 7.8 N·m (0.8 kgf·m, 69 in·lb)
Brake Reservoir Cap Screws: 1.5 N·m (0.15 kgf·m, 13 in·lb)

- After changing the fluid, check the brake for good braking power, no brake drag, and no fluid leakage.

★If necessary, bleed the air from the lines (see Bleeding the Blake Line in the Brakes chapter).

Brake Pad Wear Inspection

- Check the lining thickness and condition of the pads in each caliper.

★If either pad is damaged, replace both pads in the caliper as a set.

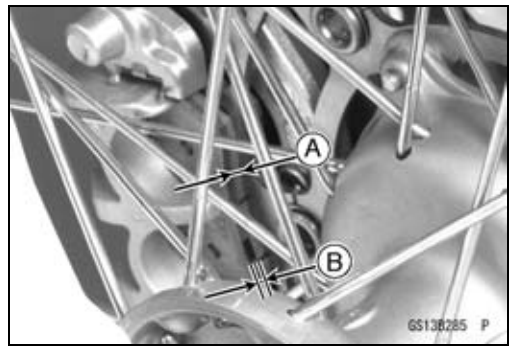
★If the lining thickness [A] of either pad is less than the service limit [B], replace both pads in the caliper as a set.

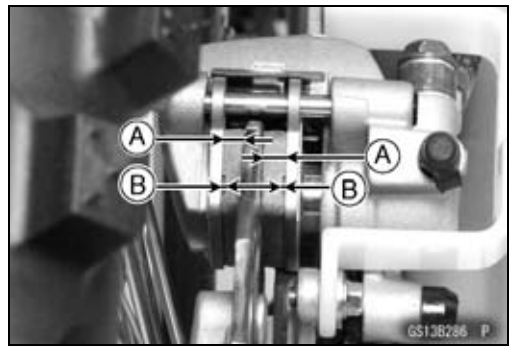
Lining Thickness
Standard:

Front	**4.0 mm (0.157 in.)**
Rear	**6.4 mm (0.252 in.)**

Service Limit:

Front	**1 mm (0.04 in.)**
Rear	**1 mm (0.04 in.)**



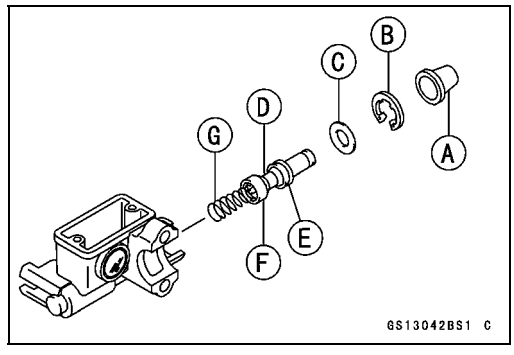


Brake Master Cylinder Cup and Dust Cover Replacement

- Remove the front master cylinder (see Front Master Cylinder Removal in the Brake chapter).
- Remove the reservoir cap and diaphragm, and pour the brake fluid into a container.
- Unscrew the locknut and pivot bolt, and remove the brake lever.
- Pull the dust cover [A] out of place, and remove the circlip [B].

Special Tool - Inside Circlip Pliers: 57001-143

- Remove the washer [C].
- Pull out the piston [D], secondary cup [E], primary cup [F], and return spring [G].



CAUTION
Do not remove the secondary cup from the piston since removal will damage it.

- Remove the rear master cylinder (see Rear Master Cylinder Removal in the Brake chapter).

NOTE

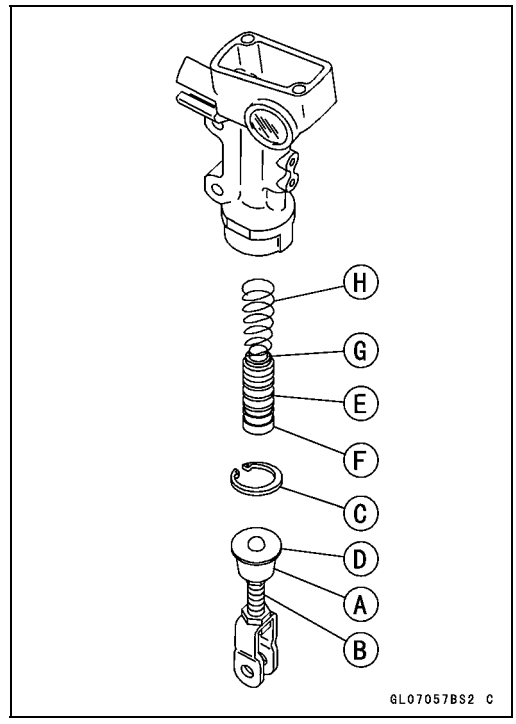
○*Do not remove the push rod clevis for master cylinder disassembly since removal requires brake pedal position adjustment.*

Periodic Maintenance Procedures

- Remove the reservoir cap and diaphragm, and pour the brake fluid into a container.
- Slide the dust cover [A] on the push rod [B] out of place, and remove the circlip [C].

Special Tool - Inside Circlip Pliers: 57001-143

- Pull out the push rod with the piston stop [D].
- Take off the piston [E], secondary cup [F], primary cup [G], and return spring [H].



CAUTION

Do not remove the secondary cup from the piston since removal will damage it.

- Before assembly, clean all parts including the master cylinder with brake fluid or alcohol.

CAUTION

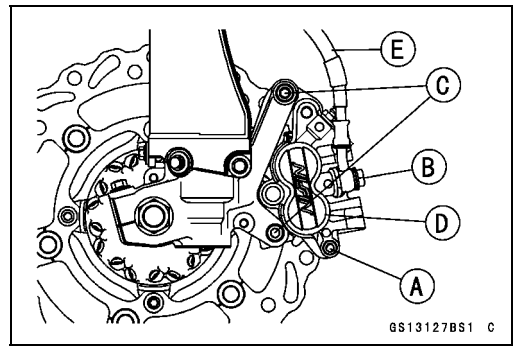
Except for the disc pads and disc, use only disc brake fluid, isopropyl alcohol, or ethyl alcohol for cleaning of the brake parts. Do not use any other fluid for cleaning of these parts. Gasoline, engine oil, or any other petroleum distillate will cause deterioration of the rubber parts. Oil spilled on any part will be difficult to wash off completely, and will eventually deteriorate the rubber used in the disc brake.

- Apply brake fluid to the removed parts and to the inner wall of the cylinder.
- Take care not to scratch the piston or the inner wall of the cylinder.
- Apply silicone grease (ex. PBC grease).
  Brake Lever Pivot Bolt
  Brake Lever Contact
  Push Rod Contact (Rear)
  Dust Covers
- Tighten:

Torque - Brake Lever Pivot Bolt: 5.9 N·m (0.6 kgf·m, 52 in·lb)
Brake Lever Pivot Bolt locknut: 5.9 N·m (0.6 kgf·m, 52 in·lb)

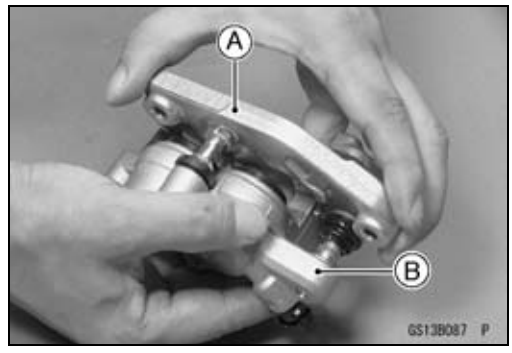
Caliper Fluid Seal and Dust Seal Replacement

- Loosen the brake pad pin [A] and banjo bolt [B], and tighten them loosely.
- Remove:
  Front Caliper Mounting Bolts [C]
  Banjo Bolt
  Brake Hose [E]
  Front Caliper [D] (see Caliper Removal in the Brakes chapter)
  Brake Pads (see Brake Pad Removal in the Brakes chapter)



Periodic Maintenance Procedures

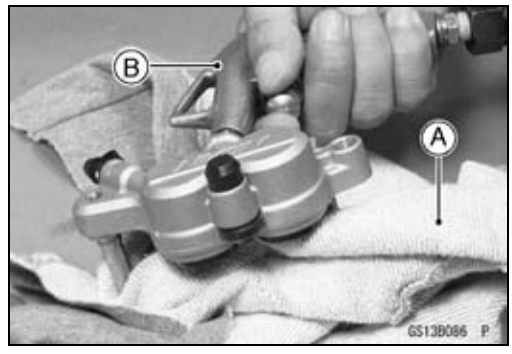
● Separate the caliper holder [A] from the caliper [B] and remove the anti-rattle spring.



● Using compressed air, remove the pistons. One way to remove the pistons is as follows.
○Cover the caliper opening with a clean, heavy cloth [A].
○Remove the pistons by lightly applying compressed air [B] to the hose joint opening.

⚠ WARNING

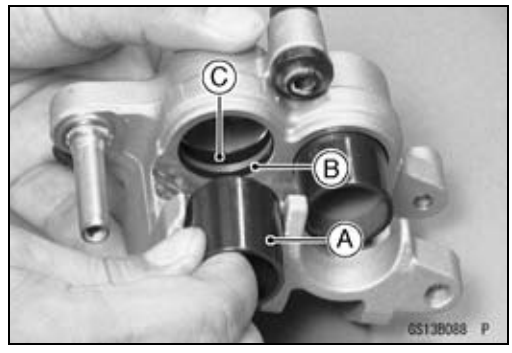
To avoid serious injury, never place your fingers or palm in front of the piston. If you apply compressed air into the caliper, the piston may crush your hand or fingers.



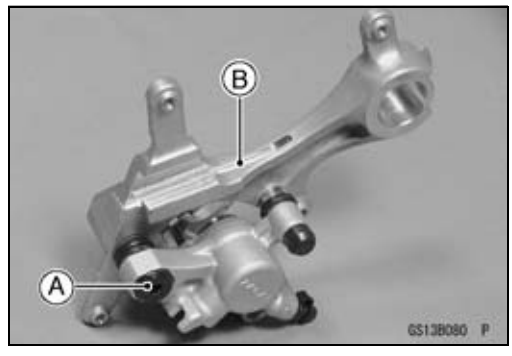
● Pull out the piston [A] by hand.
● Remove the dust seals [B] and fluid seals [C].

NOTE

○*If compressed air is not available, do as follows for both calipers coincidentally, with the brake hose connected to the caliper.*
○*Prepare a container for brake fluid, and perform the work above it.*
○*Remove the spring and pads (see Brakes chapter)*
○*Pump the brake lever until the pistons come out of the cylinders, and then disassemble the caliper.*



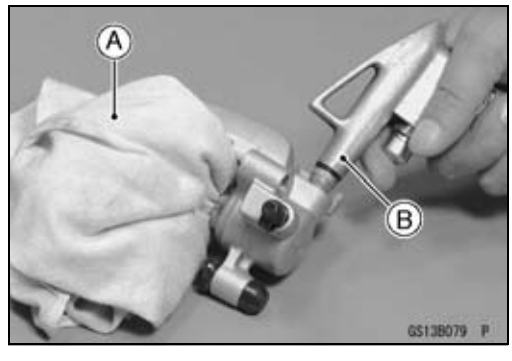
● Remove the rear caliper (see Caliper Removal in the Brakes chapter).
● Remove the pads (see Brake Pad Removal in the Brakes chapter).
● Separate the caliper holder [B] from the caliper [A].



● Using compressed air, remove the piston.
○Cover the caliper opening with a clean, heavy cloth [A].
○Remove the piston by lightly applying compressed air [B] to where the brake line fits into the caliper.

⚠ WARNING

To avoid serious injury, never place your fingers or palm inside the caliper opening. If you apply compressed air into the caliper in such condition, the piston may crush your hand or finger.

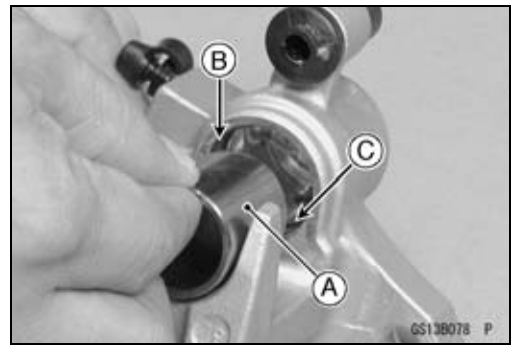


Periodic Maintenance Procedures

- Pull out the piston [A] by hand.
- Remove the dust seal [B] and fluid seal [C].
- Clean the caliper parts except for the pads.

CAUTION

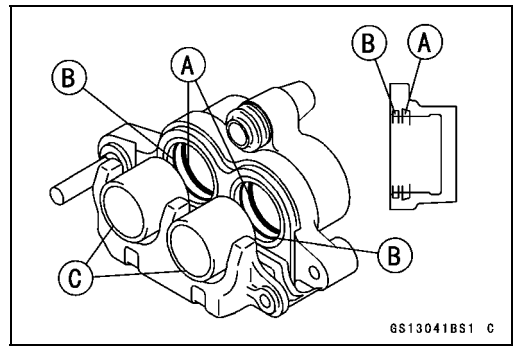
For cleaning of the parts, use only disc brake fluid, isopropyl alcohol, or ethyl alcohol.

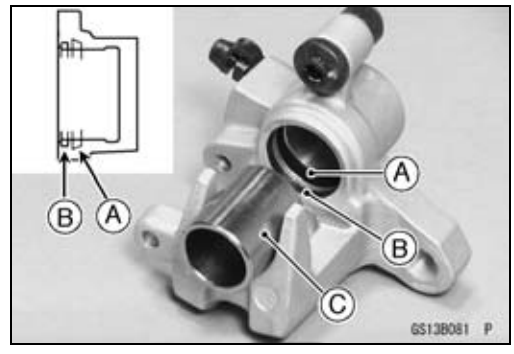


- The bleed valve was removed, install the bleed valve and rubber cap.

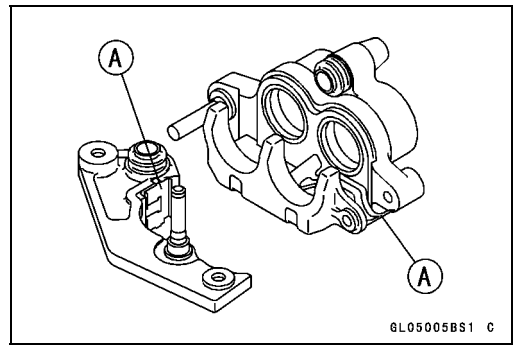
Torque - Bleed Valve: 7.8 N·m (0.80 kgf·m, 69 in·lb)

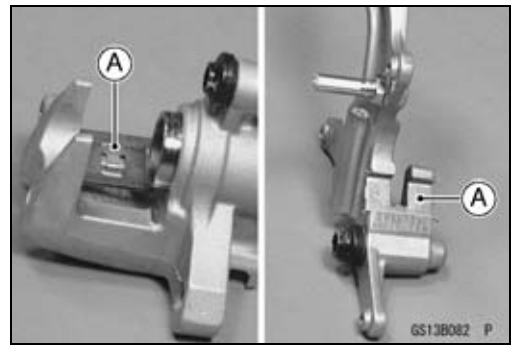
- Replace the fluid seal(s) [A] with new ones.
○Apply brake fluid to the fluid seal(s), and install them into the cylinders by hand.
- Replace the dust seal(s) [B] with new ones.
○Apply brake fluid to the dust seal(s), and install them into the cylinder by hand.
- Apply brake fluid to the outside of the pistons [C], and push them into each cylinder by hand.





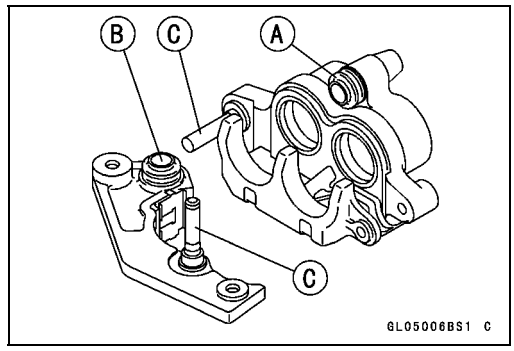
- Install the anti-rattle spring [A] in the caliper as shown.

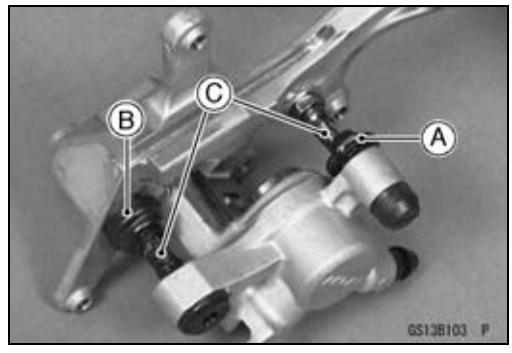




Periodic Maintenance Procedures

- Replace the shaft rubber boot [A] and dust boot [B] if they are damaged.
- Apply a thin coat of PBC (Poly Butyl Cuprysil) grease to the caliper holder shafts [C] and holder holes (PBC is a special high temperature, water-resistance grease).





- Install the pads (see Brake Pad Installation in the Brakes chapter).
- Install the caliper (see Caliper Installation in the Brakes chapter).
- Wipe up any spilled brake fluid on the caliper with wet cloth.

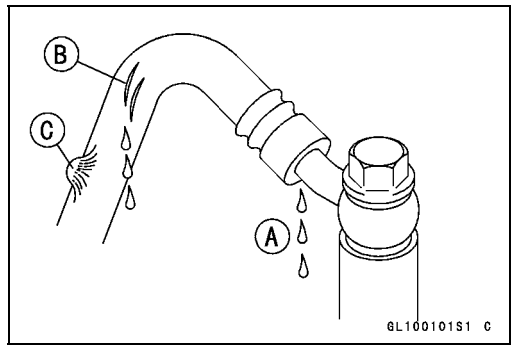
Brake Hoses and Connections Inspection

- Inspect the brake hose and fittings for deterioration, cracks and signs of leakage.

○The high pressure inside the brake line can cause fluid to leak [A] or the hose to burst if the line is not properly maintained. Bend and twist the rubber hose while examining it.

★Replace the hose if any cracks [B] or bulges [C] are noticed.

★Tighten any loose fittings.



Brake Hose Replacement

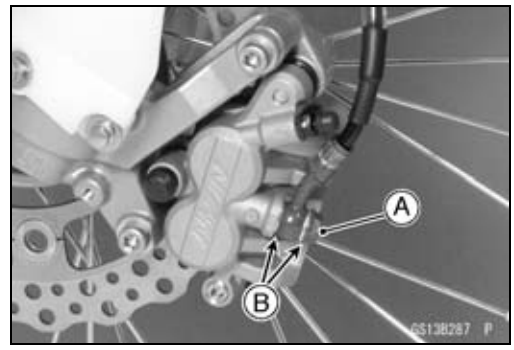
CAUTION

Brake fluid quickly ruins painted surfaces; any spilled fluid should be completely washed away immediately.

- When removing the brake hose, take care not to spill the brake fluid on the painted or plastic parts.
- When removing the brake hose temporarily secure the end of the brake hose to some high place to keep fluid loss to a minimum.
- Immediately wash away any brake fluid that spills.

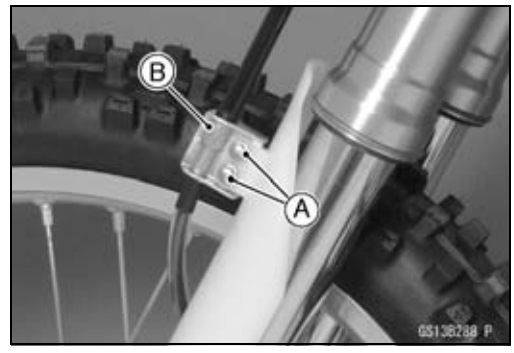
Periodic Maintenance Procedures

- Remove each banjo bolts [A] and washers [B].
- Replace the washers with new ones.



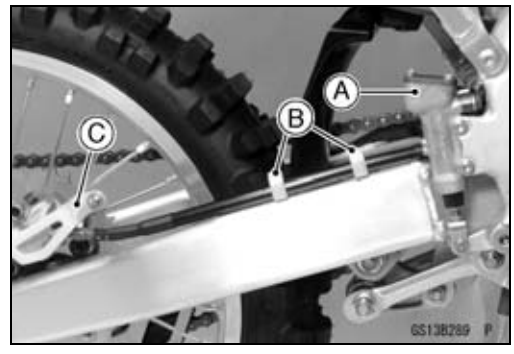
For Front Brake Hose

- Remove
  Bolts [A]
  Brake Hose Clamps [B]



For Rear Brake Hose

- Remove:
  Master Cylinder [A]
  Hose Clamps [B]
  Caliper Cover [C]



- When installing the hoses, avoid sharp bending, kinking, flattening or twisting, and route the hoses according to Cable, Wire, and Hose Routing section in the Appendix chapter.
- Tighten the banjo bolts on the hose fittings.

  Torque - Brake Hose Banjo Bolts: 25 N·m (2.5 kgf·m, 18 ft·lb)

- Fill the brake line after installing the brake hose (see Brake Fluid Change).

Suspension

Front Fork Inspection

- Holding the brake lever, pump the front fork back and forth manually to check for smooth operation.
- Visually inspect the front fork for oil leakage, scoring or scratches on the outer surface of the inner tube [A].

★If necessary, repair any damage.

- Nick or rust damage can sometimes be repaired by using a wet-stone to remove sharp edges or raised areas which cause seal damage.

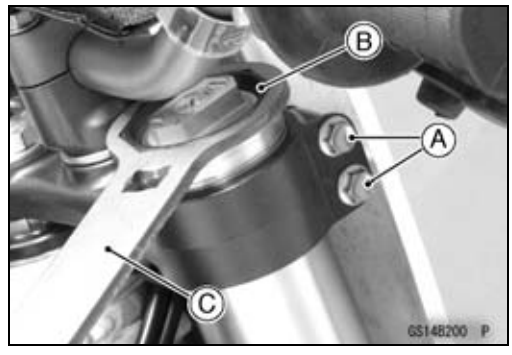
★If the damage is not repairable, replace the inner tube. Since damage to the inner tube damages the oil seal, replace the oil seal whenever the inner tube is repaired or replaced.

- If the fork is not smooth, confirm the cause.

CAUTION

If the inner tube is badly bent or creased, replace it. Excessive bending, followed by subsequent straightening, can weaken the inner tube.

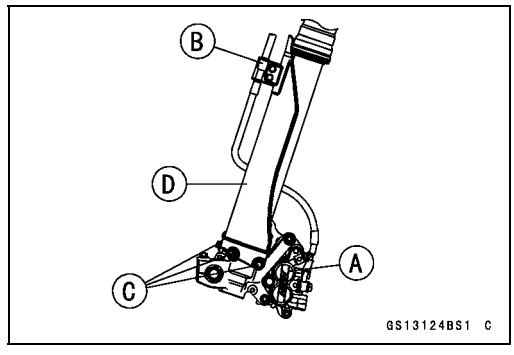
Front Fork Oil Change (each fork leg)



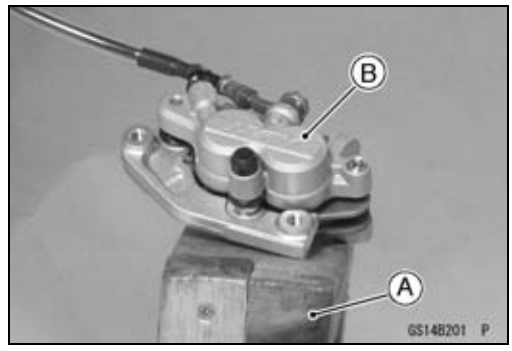
- Loosen the front fork upper clamp bolts [A].
- Loosen the front fork cylinder unit [B] using the top plug wrench [C].

Special Tool - Top Plug Wrench, 50 mm: 57001-1645

- Remove:
  Front Wheel (see Front Wheel Removal in the Wheels/Tires chapter)
  Front Brake Caliper [A] (for left fork leg)
  Brake Hose Clamps [B] (for left fork leg)
  Bolts [C]
  Front Fork Protector [D]

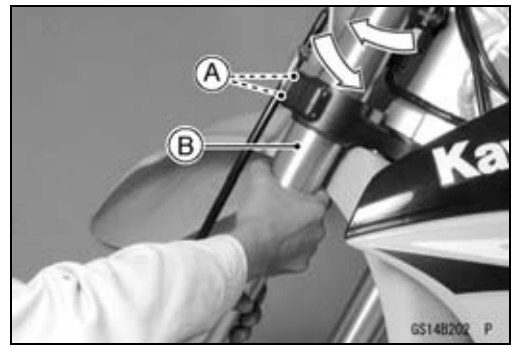


○Rest the caliper [B] on some kind of stand [A] so that it doesn't dangle.

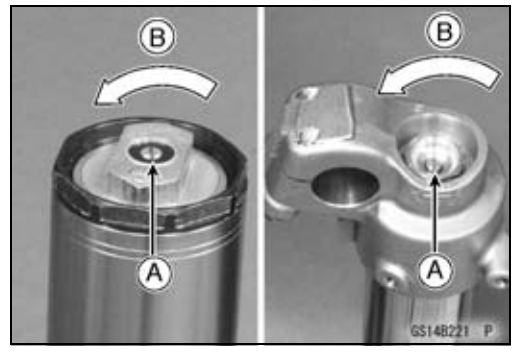


Periodic Maintenance Procedures

● Loosen the front fork lower clamp bolts [A].
● Remove the front fork.
○With a twisting motion, work the fork leg [B] down and out.

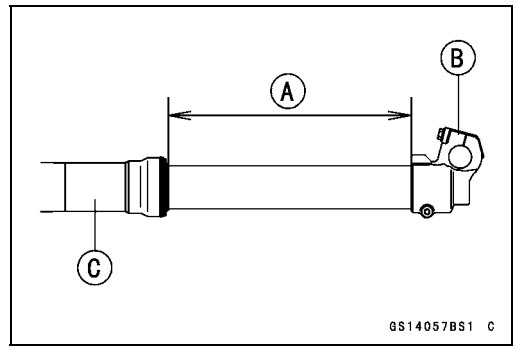


● Record the position of the damping adjusters [A] and then turn [B] it to the softest position.



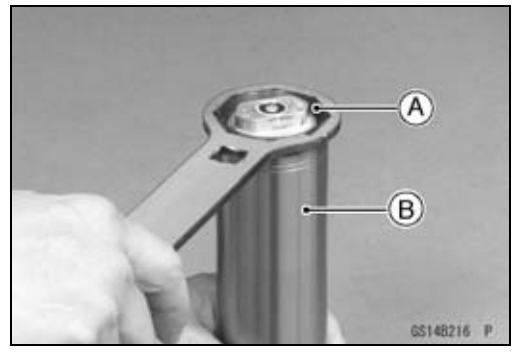
● Measure the length [A] between the top surface of the axle holder [B] and under surface of the outer tube [C].
○Record the length before disassembling the fork.

Length
Standard: 319 ±2 mm (12.6 ±0.08 in.)



● Unscrew the fork cylinder unit [A] from the outer tube [B].
● Slowly slide down the outer tube.

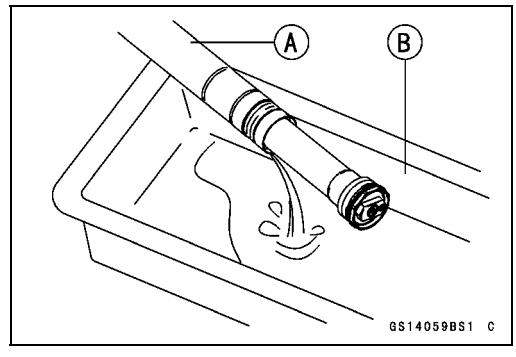
Special Tool - Top Plug Wrench, 50 mm: 57001-1645



● Hold the fork tube [A] upside down over a clean container [B] and pump it to drain the oil.

NOTE

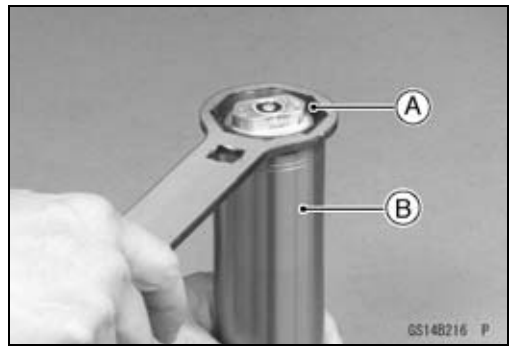
○*Pump the outer tube up and down to discharge the fork oil.*



Periodic Maintenance Procedures

● Temporarily install the fork cylinder unit [A] to the outer tube [B].

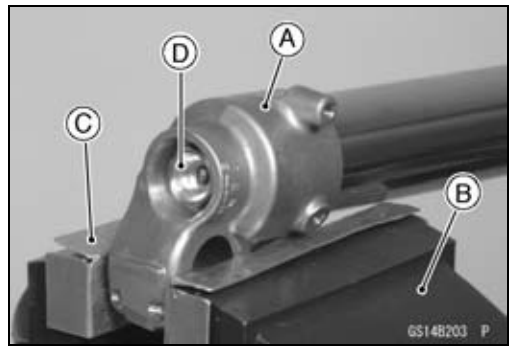
Special Tool - Top Plug Wrench, 50 mm: 57001-1645



● Hold the axle holder part [A] with a vise [B].
○Protect the axle holder part with a soft jaws [C] or heavy cloth when using a vise.
● Unscrew the adjuster assembly [D] completely.

NOTE

○*When removing the adjuster assembly, do not force to unscrew it at once using an impact wrench.*

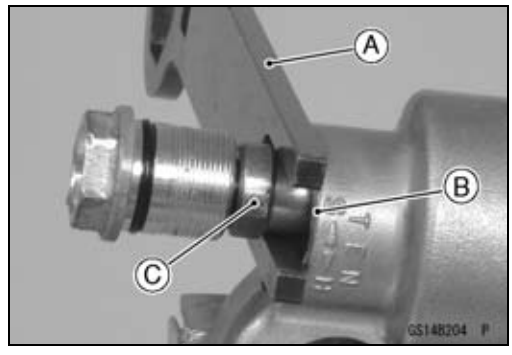


● Compress the outer tube by hand and install the top plug wrench [A] between the axle holder part bottom [B] and locknut [C].

Special Tool - Top Plug Wrench, 50 mm: 57001-1645

⚠ WARNING

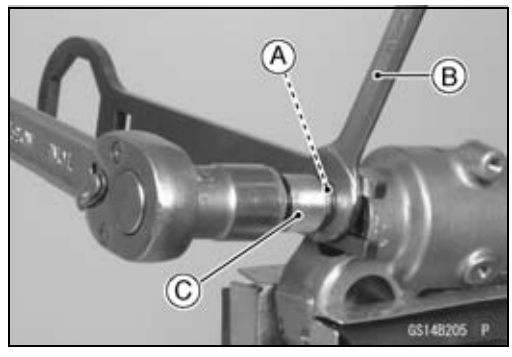
Be careful of reaction force in spring and fix surely so that the special tool should not come off. Do not place the finger etc. while servicing.



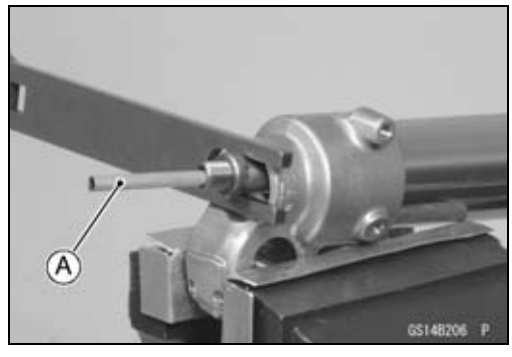
● Hold the locknut [A] with a wrench [B] and remove the adjuster assembly [C].

NOTE

○*Do not remove the locknut from the piston rod. The piston rod may slide into the inner tube.*



● Take the rebound damping adjuster rod [A] out of the piston rod.



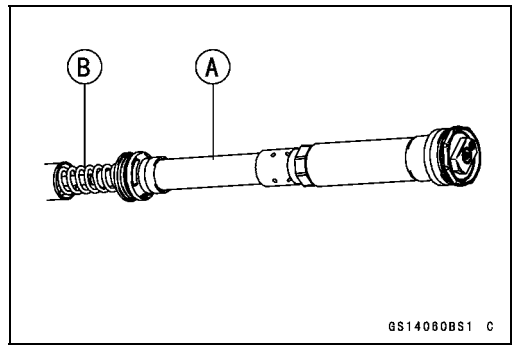
Periodic Maintenance Procedures

● With the outer tube compressed by hand, remove the top plug wrench.

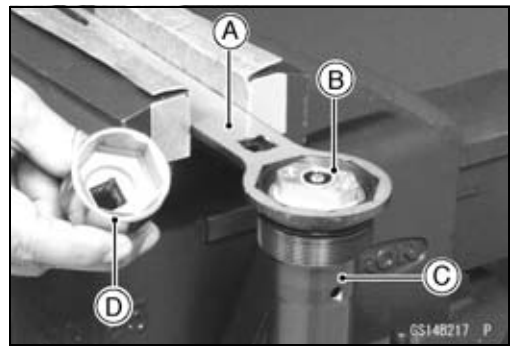
CAUTION

Removing the locknut and pushing the piston rod thread into the cylinder unit will damage the oil seal. Do not remove the locknut from the piston rod. Be careful of reaction force from the fork spring when removing the top plug wrench. Hold the cylinder unit tight enough so that the locknut does not damage the fork leg.

● Unscrew the fork cylinder unit.
● Remove:
Fork Cylinder Unit [A]
Spring [B]



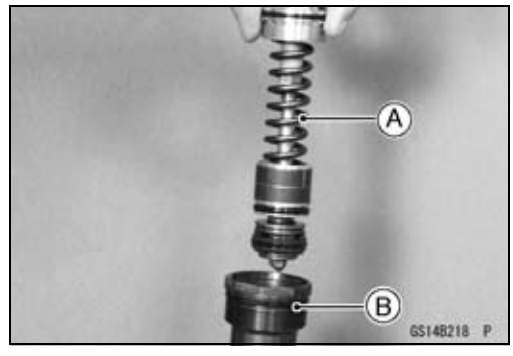
● Holding the top plug wrench [A] with a vise, unscrew the base valve assembly [B] on the fork cylinder unit [C].
○Use a hexagon box wrench [D].



● Pull out the base valve assembly [A] from the fork cylinder unit [B].
○Slowly compress the piston rod until it stops so that the base valve assembly can be removed easily.

CAUTION

Be careful not to damage the bushing of the base valve assembly.
Disassembling the base valve assembly can lead to trouble. Do not disassemble the base valve assembly.

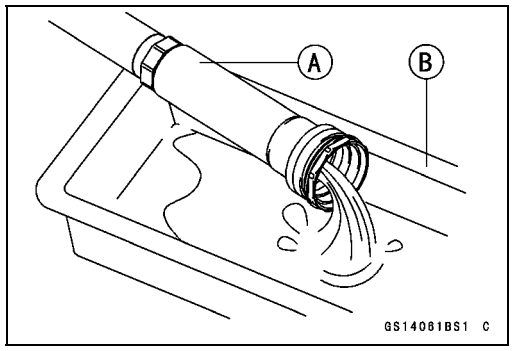


Periodic Maintenance Procedures

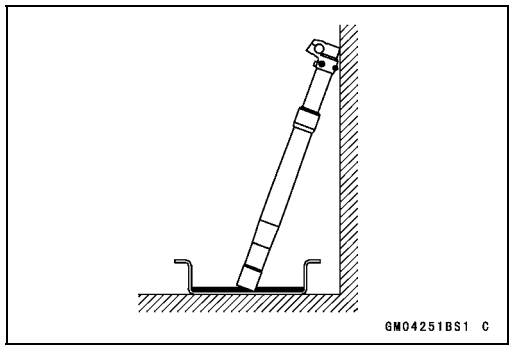
- Hold the fork cylinder unit [A] upside down over a clean container [B] and pump it to drain the oil.

NOTE

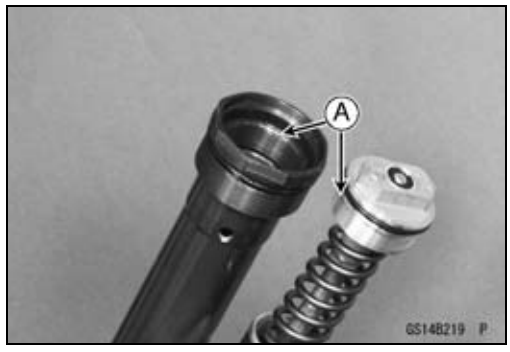
○*Pump the piston rod up and down to discharge the fork oil.*



- Hold the front fork at the inverted position for more than 20 minutes to allow the fork oil to fully drain.

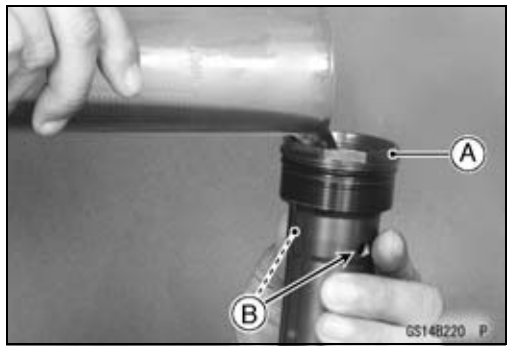


- Clean the threads [A] of the fork cylinder unit and base valve assembly.

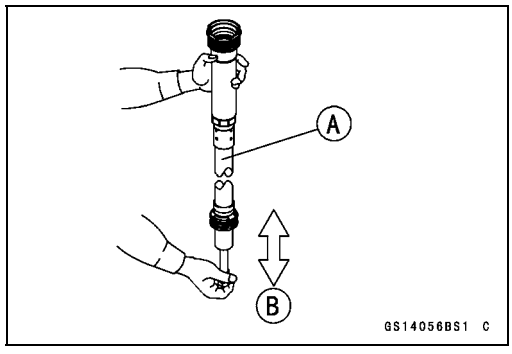


- Hold the fork cylinder unit [A] upright with the piston rod fully stretched.
- Plug the two oil holes [B] on the cylinder unit with fingers.
- Pour 193 mL (6.53 US oz.) of specified oil.

Recommended Oil
SHOWA SS-05 or equivalent



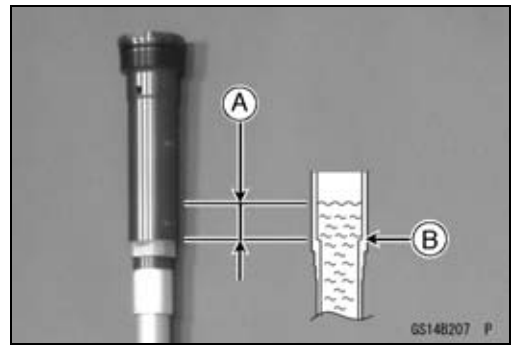
- Purge the air from the fork cylinder [A] by gently moving [B] the piston rod up and down several times.



Periodic Maintenance Procedures

● With the piston rod fully stretched, check the oil level in the fork cylinder unit.
○Measure the oil level [A] from the step [B] in the cylinder unit using the suitable gauge.

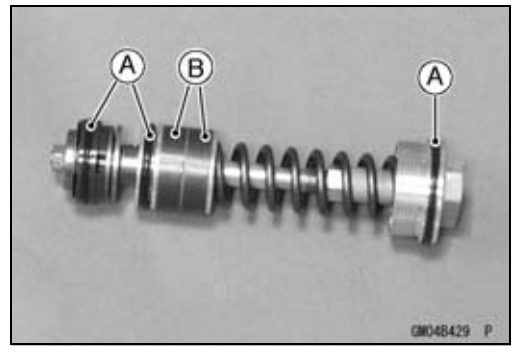
Fork Cylinder Unit Oil Level
42 ~ 49 mm (1.65 ~ 1.93 in.)



● Replace the O-rings [A] on the base valve assembly with new ones.
● Apply fork oil to the O-rings and bushings [B].

CAUTION

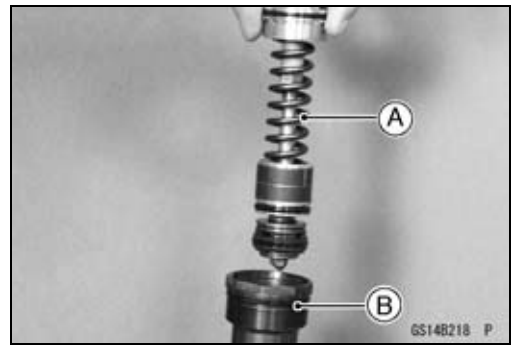
Do not damage the bushings when assembling the base valve.



● With the piston rod held immovable fully stretched, gently install the base valve assembly [A] to the fork cylinder unit [B].

NOTE

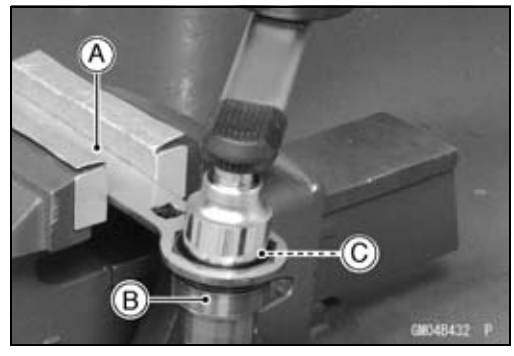
○*If there is difficulty in assembling the base valve, it may be because the oil level is too high. Check the oil level in the fork cylinder unit.*



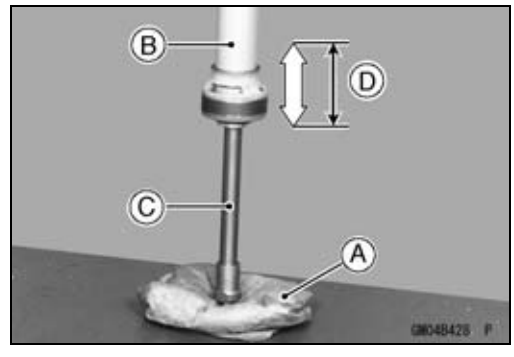
● Hold the top plug wrench [A] with a vise.
● Holding the fork cylinder unit [B] with the top plug wrench.
● Tighten the base valve assembly [C].

Special Tool - Top Plug Wrench, 50 mm: 57001-1645

Torque - Base Valve Assembly: 29 N·m (3.0 kgf·m, 22 ft·lb)

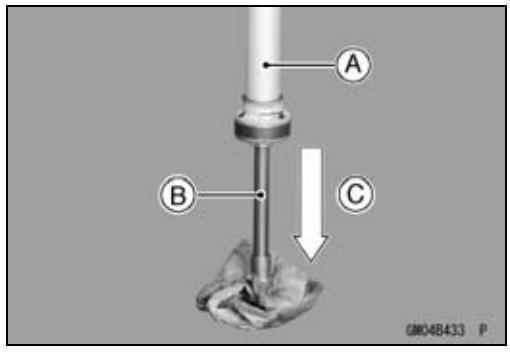


● Turn the locknut fully in.
● Apply fork oil to the piston rod sliding surface.
● Protect the piston rod end with a heavy cloth [A] to prevent thread damage.
● Hold the cylinder unit [B] at the up right position.
● Slowly pump the piston rod [C] several times about 100 mm [D].



Periodic Maintenance Procedures

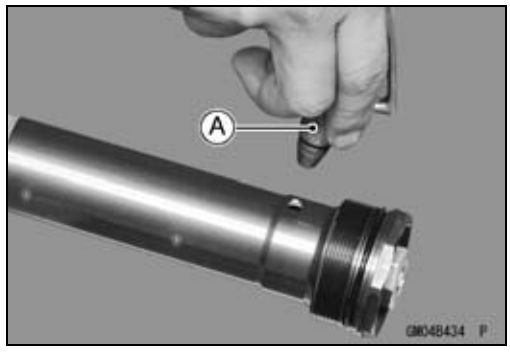
● Discharge the extra oil off the cylinder unit [A] by pumping the piston rod [B] to full stroke [C].



CAUTION

Be careful not to bend or damage the piston rod when the piston rod is stroked. Service carefully because oil files out from the oil hole of the cylinder unit.

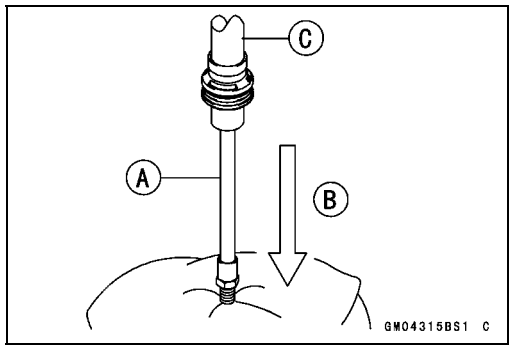
● Check the compression damping force setting to the softest.
● Check the piston rod sliding surface for damage.
● Drain the extra oil from the cylinder unit oil hole.
● Blow out the extra oil from the oil hole of the cylinder unit with the compressed air [A] blow to the oil hole.
● Wipe the oil off completely from the cylinder unit.



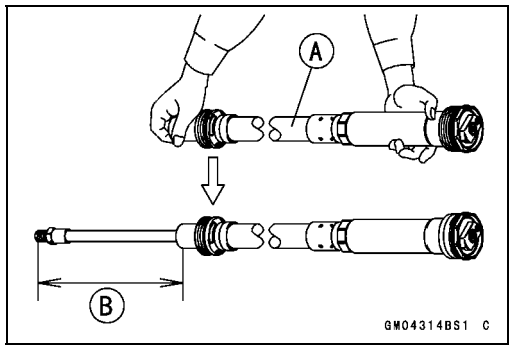
NOTE

○*If you cannot use compressed air, remove the pressure relief screw of the fork cap. Up side down the fork cylinder unit for 10 minutes and drain the oil from the cylinder unit. Reinstall the pressure relief screw.*

● Protect the piston rod end with a heavy cloth to prevent damage.
● Pump the piston rod [A] to full stroke [B] by pushing down the fork cylinder unit [C].
● Check the piston rod for smooth operation.
★If the piston rod operation is not smooth, check the piston rod for bend or damage.



● Hold the fork cylinder unit on level ground [A] while piston rod is full stroked by your hand.
● Release the piston rod then check the piston rod extend to maximum [B].
★If the piston rod does not extend to maximum, bleed the cylinder unit again.

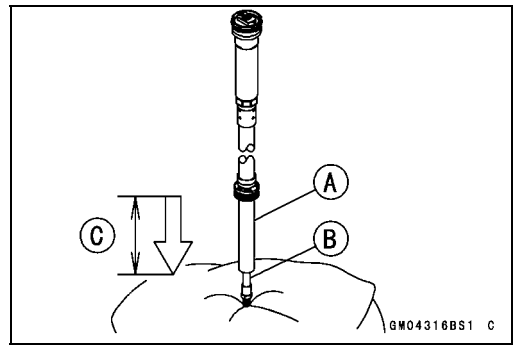


CAUTION

Be careful not to bend or damage the piston rod when the piston rod is stroked.

Periodic Maintenance Procedures

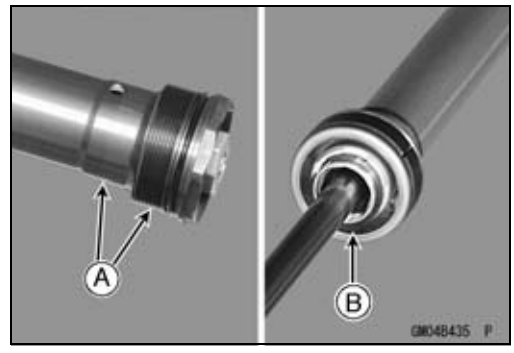
- Wipe the oil off completely from the cylinder unit [A].
- Compress the piston rod [B] to 200 ~ 250 mm (7.9 ~ 9.8 in.) [C] and hold the cylinder unit upright position for 10 minutes.



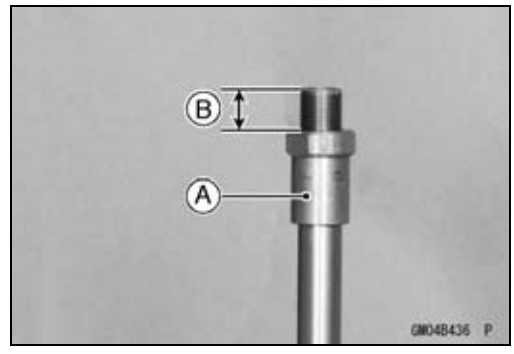
- There should be no oil leak from the base valve assembly part [A] or bottom of the cylinder.

★If oil leaks from the base valve assembly part or bottom of the cylinder [B], replace the cylinder unit.

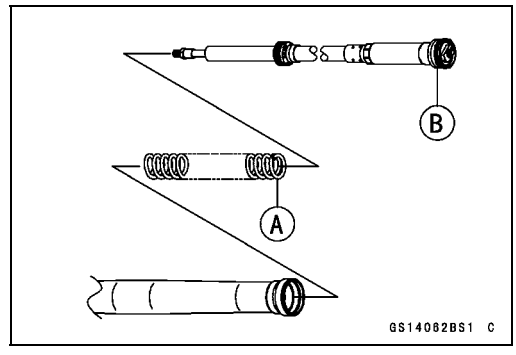
- Hold the cylinder unit on level ground and release the piston rod then check the piston rod extend to maximum.



- Tighten the locknut [A] fully and measure 10 ~ 12 mm [B] as shown.



- Completely wipe off the fork oil from the spring and fork cylinder unit.
- Install:
  Spring [A]
  Fork Cylinder Unit [B]



- Temporarily tighten the fork cylinder unit using the top plug wrench.

Special Tool - Top Plug Wrench, 50 mm: 57001-1645

- Holding the axle holder part with a vise.

○Protect the axle holder part with a soft jaw or heavy cloth when using a vise.

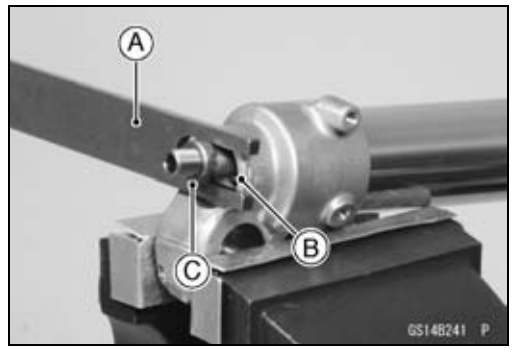
⚠ WARNING

Clamping the axle holder part too tight can damage it which will affect riding stability. Do not clamp the axle holder part too tight.

Periodic Maintenance Procedures

- Compress the outer tube by hands and insert the top plug wrench [A] between the axle holder part bottom [B] and locknut [C].

Special Tool - Top Plug Wrench, 50 mm: 57001-1645



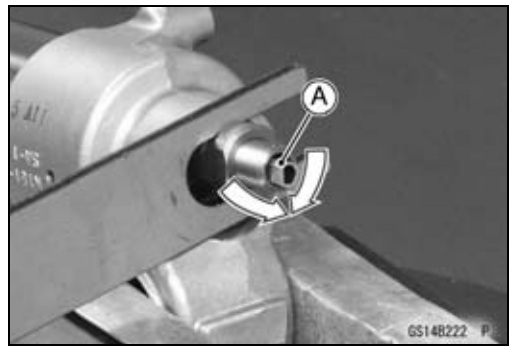
⚠ WARNING

Be careful of reaction force in spring and fix surely so that special tool should not come off. Do not place the fingers etc. while serving.

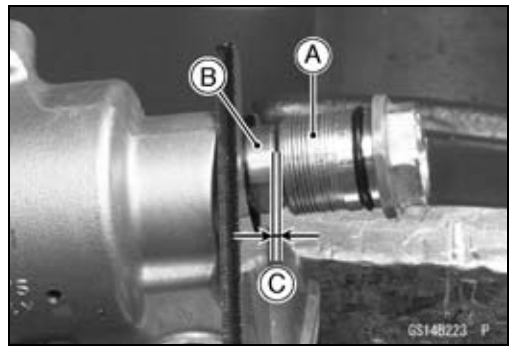
- Insert the push rod [A] into the piston rod.

NOTE

○*Check the push rod installation with its click by turning the push rod right and left.*



- Replace the O-ring with new one and apply specified fork oil to the O-ring.
- Slowly turn the adjuster assembly [A] clockwise until resistance is felt and check the clearance between the locknut [B] and adjuster assembly for more than 1 mm (0.04 in.) [C].



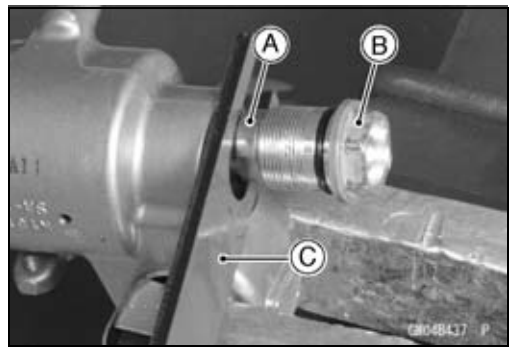
- Turn the locknut [A] counterclockwise until it contacts with the adjuster assembly [B].

Torque - Adjuster Assembly Locknut: 22 N·m (2.2 kgf·m, 16 ft·lb)

- Apply a non-permanent locking agent to the adjuster assembly.
- With the locknut held immovable using a wrench, tighten the adjuster assembly.

Torque - Adjuster Assembly: 69 N·m (7.0 kgf·m, 51 ft·lb)

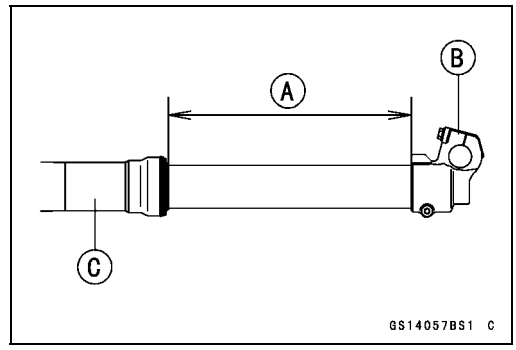
- With the outer tube compressed by hands, remove the top plug wrench [C].



Periodic Maintenance Procedures

● Compare the length [A] at assembly and at disassembly.
○There should be same length.
★If the length at assembly is longer than at disassembly, check the adjuster assembly and locknut installation.
Axle Holder [B]
Outer Tube [C]

Length
Standard: 319 ±2 mm (12.6 ±0.08 in.)

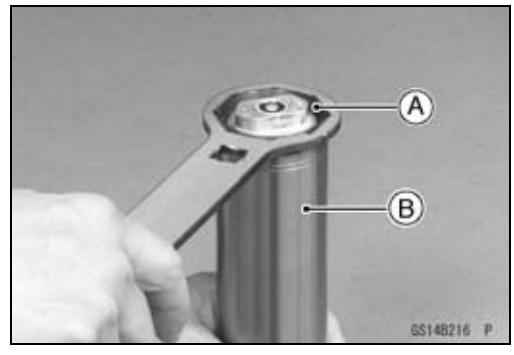


● Using the top plug wrench, unscrew the fork cylinder unit.
● Pour the specified amount of fork oil into the outer tube.

Recommended Oil
SHOWA SS-05 or equivalent
Oil Capacity (in outer tube)

Standard:	**360 ±2.5 mL (12.2 ±0.08 US oz.) (KX250T6F)** **373 ±2.5 mL (12.6 ±0.08 US oz.) (KX250T7F ~)**
Adjustable Range:	**322 ~ 417 mL (10.9 ~ 14.1 US oz.) (KX250T6F)** **324 ~ 419 mL (11.0 ~ 14.2 US oz.) (KX250T7F ~)**

● Raise the outer tube and temporarily install the cylinder unit [A] to the outer tube [B] using the top plug wrench.
Special Tool - Top Plug Wrench, 50 mm: 57001-1645

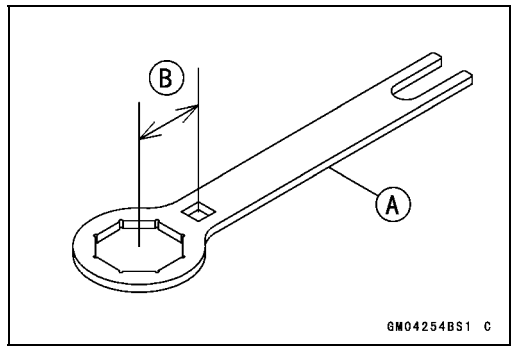


● Install the front fork (see Front Fork Installation in the Suspension chapter).
● Tighten the front fork lower clamp bolts.
Torque - Front Fork Clamp Bolts (Lower): 20 N·m (2.0 kgf·m, 14 ft·lb)

Periodic Maintenance Procedures

The torque of fork cylinder unit is specified to 34 N·m (3.5 kgf·m, 25 ft·lb), however, when you use the top plug wrench [A], reduce the torque to 90% of the specified value [31 N·m (3.1 kgf·m, 23 ft·lb)] due to the distance [B] between the center of the square hole, where the torque wrench is fitted [C], and that of the octagonal hole of the wrench.

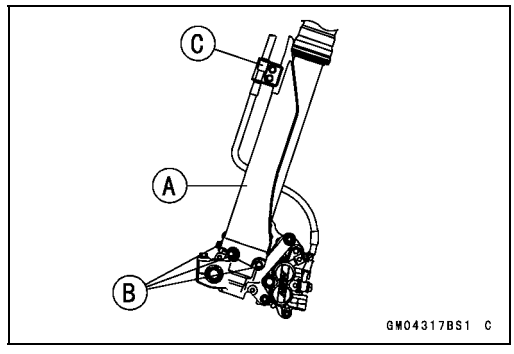
This torque value [31 N·m (3.1 kgf·m, 23 ft·lb)] is applicable when you use a torque wrench whose length gives leverage of approximately 310 mm between the grip point to the center of the coupling square.



Torque - Fork Cylinder Unit: 34 N·m (3.5 kgf·m, 25 ft·lb)
Front Fork Upper Clamp Bolts: 20 N·m (2.0 kgf·m, 14.5 ft·lb)

- Install:
  Front Wheel (see Front Wheel Installation in the Wheels/Tires chapter)
  Front Brake Caliper (see Caliper Installation in the Brakes chapter)

- Install:
  Front Fork Protector [A]
  Bolts [B]
  Front Brake Hose Clamps [C] (left front fork only)
- Set the damping adjusters to the position recorded before removing the front fork.

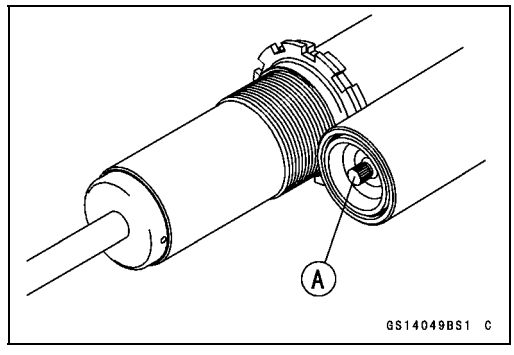


Rear Shock Absorber Oil Change

The oil should be changed in the rear shock absorber at least once per racing season. The frequency for best performance must be based upon riding conditions and rider ability.

- Remove the rear shock absorber from the frame (see Rear Shock Absorber Removal in the Suspension chapter).
- Remove the shock absorber spring (see Spring Replacement in the Suspension chapter).

- Remove the gas reservoir valve cap [A].
- Point the valve away from you. Slowly release nitrogen gas pressure from the gas reservoir by pushing down the valve core with a screw driver.

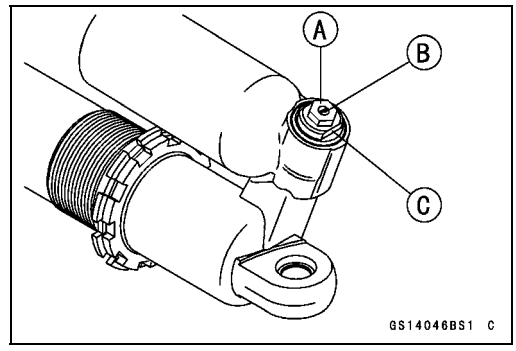


Periodic Maintenance Procedures

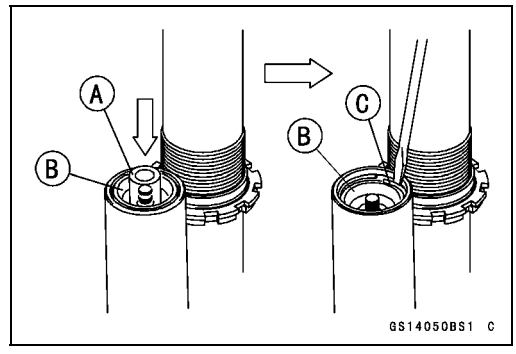
⚠ WARNING

Do not to point the reservoir valve toward your face or body when releasing nitrogen gas pressure. An oil mist is often released with the nitrogen. Always release nitrogen gas pressure before disassembling the rear shock absorber to prevent explosive separation of parts.

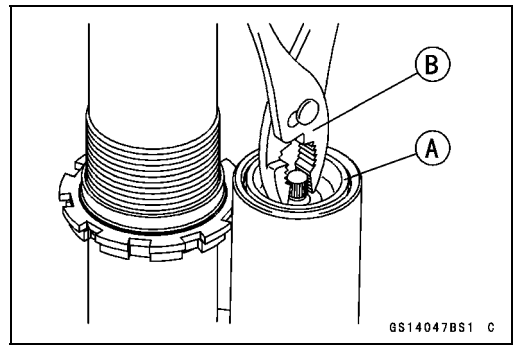
- Adjust the gas reservoir damping adjusters to the softest position.
  High Speed Compression Damping Adjuster [A]
  Low Speed Compression Damping Adjuster [B]
- Remove the adjuster assembly [C] and pump the rear shock to drain the oil out the rear shock body.



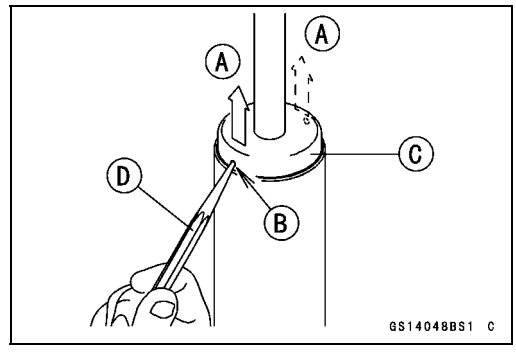
- Using the suitable tool [A] and press, push the reservoir cap [B] in 10 mm (0.39 in.).
- Remove the circlip [C] from the gas reservoir.



- Install the valve cap.
- Pull the gas reservoir cap [A] out of the gas reservoir using the pliers [B].

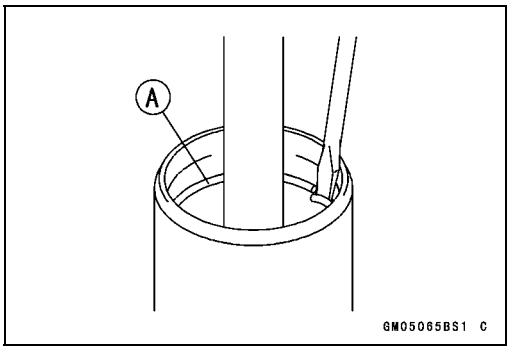


- Tap [A] evenly at the holes [B] in the stopper [C] with suitable tools [D] to free the stopper from the rear shock body.



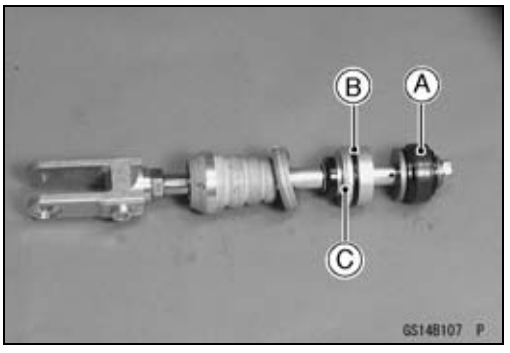
Periodic Maintenance Procedures

- Slide up the stopper of the piston rod, then lightly tap around the seal with a suitable rod and mallet, and push the seal assembly 10 mm (0.39 in.) down.
- Remove the circlip [A].
- Lightly move the piston rod back and forth, and pull out the piston rod assembly.
- Pour the remain oil out of the rear shock body.

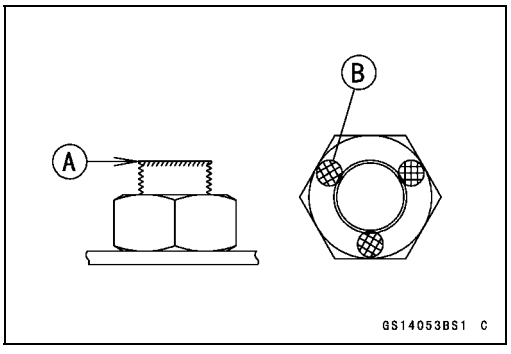


- Visually inspect the piston [A], O-ring [B], and oil seal assy [C].

★If the piston, O-ring and oil seal assy are badly scored, rusty or damaged, replace them.

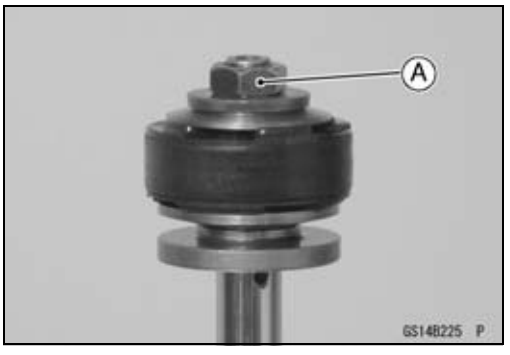


- Using the grinder, shave off the stake portions [A] of the rod and nut [B].

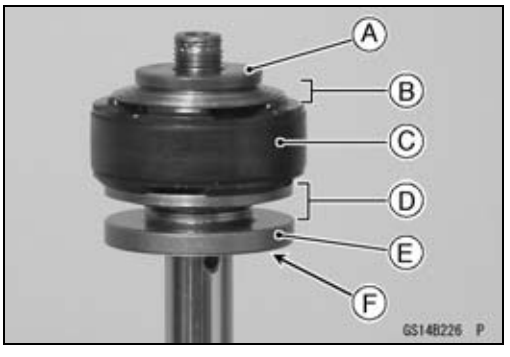


- Hold the lower of the piston rod assembly in a vise with soft jaws or a heavy cloth.
- Remove the locknut [A] and discard it.

CAUTION
Do not tighten the rebound damping adjuster of the piston rod.

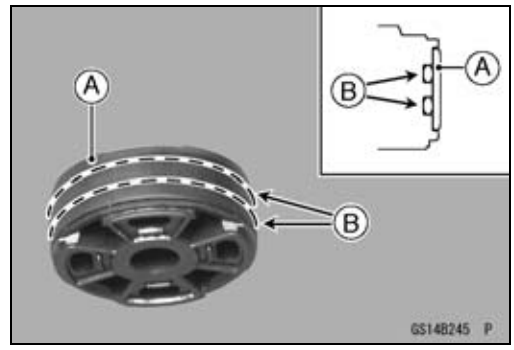


- Remove the piston rod assembly from the vise.
- Remove:
  Stopper [A]
  Rebound Side Washers [B]
  Piston [C]
  Compression Side Washers [D]
  Stopper [E]
  Washer [F]

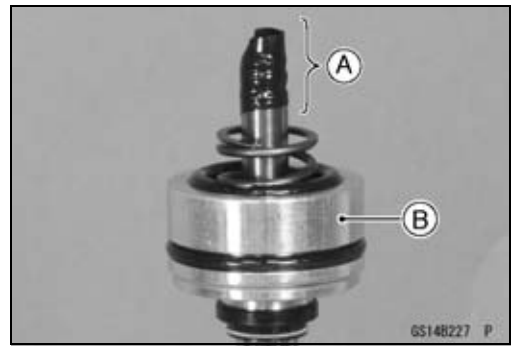


Periodic Maintenance Procedures

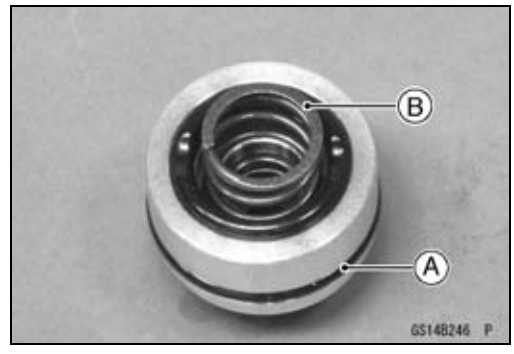
- Inspect the slide bushing [A].
★If the bushing is damaged, replace it.
- Cut the slide bushing [A].
- Remove the O-rings [B].
- Replace the O-rings with new ones.
- Install the O-rings and a new bushing on the piston.



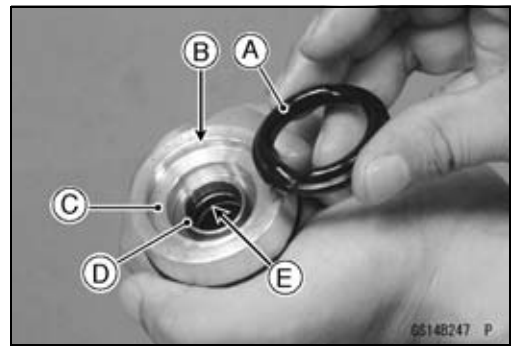
- Wrap the threads [A] of the piston rod with tape.
- Remove the oil seal assembly [B].



- Remove the O-ring [A].
- Pull out the spring [B].

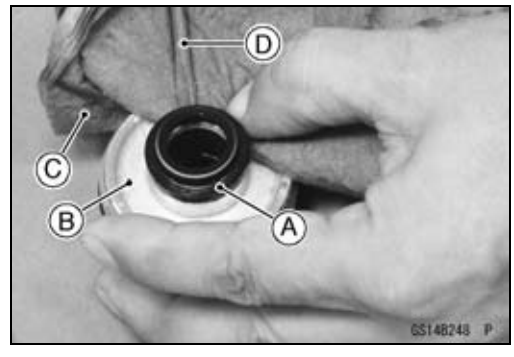


- To remove the rebound rubber [A] push one side of the rubber out of its groove [B].
- Remove:
  Collar [C]
  Spring Holder [D]
  Oil Seal [E]



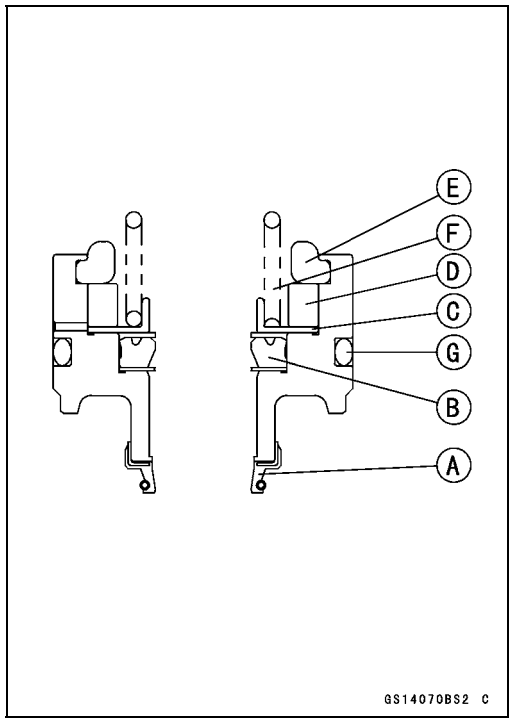
- Remove:
  Oil Seal [A]

CAUTION
To avoid damage to the surfaces of the oil seal assembly body [B], cover the screwdriver [D] with the cloth [C].

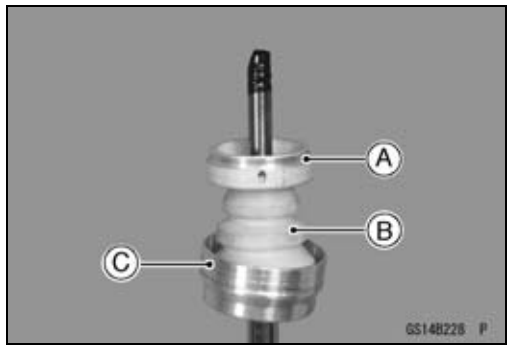


Periodic Maintenance Procedures

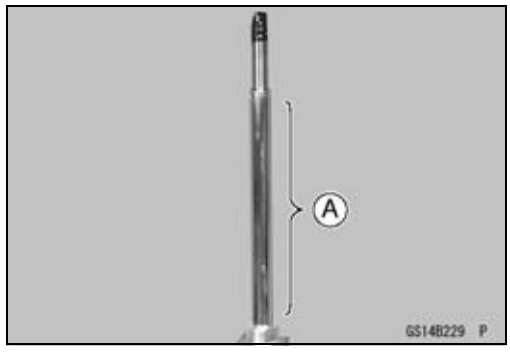
● Replace the following with new ones.
Oil Seals
Rebound Rubber (if damaged)
O-ring
● Install each parts direction as shown in the figure.
Oil Seal [A]
Oil Seal [B]
Spring Holder [C]
Collar [D]
Rebound Rubber [E]
Spring [F]
O-ring [G]



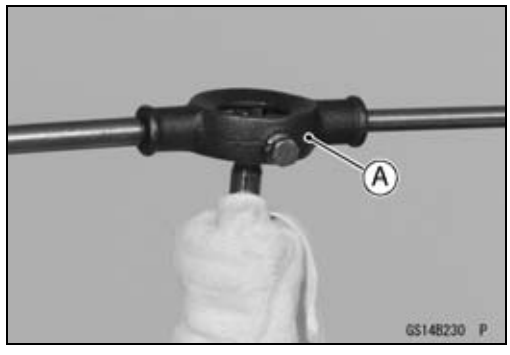
● Remove:
Stopper [A]
Damper [B]
Damper Holder [C]



● Inspect the piston rod sliding surface [A].
★If the sliding surface is scratches or distortion, replace it.

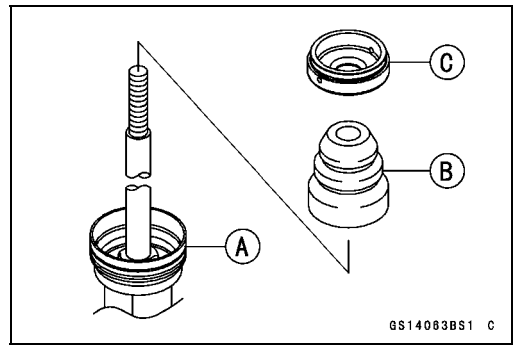


● Hold the lower of the piston rod assembly in a vise with soft jaws or heavy cloth.
● Make the threads of the piston rod end using the die [A].
Die:ϕ12 × 1.25 mm
● Clean all parts with solvent and dry them with compressed air.

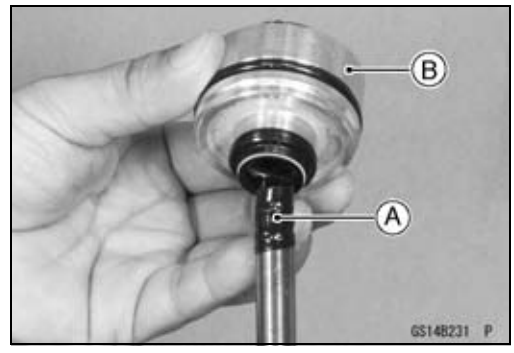


Periodic Maintenance Procedures

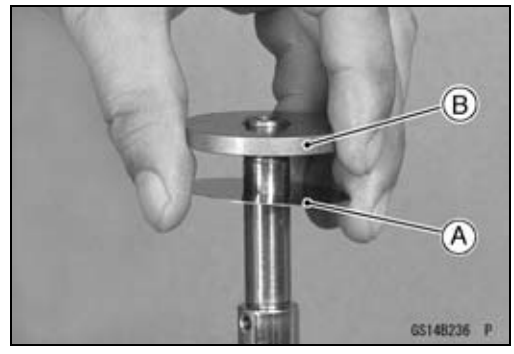
● Install:
Damper Holder [A]
Damper [B]
Stopper [C]



● Wrap the threads of the piston rod with tape [A].
● Apply thin coat of shock oil to the sliding surface of the piston rod.
● Insert the oil seal assembly [B].

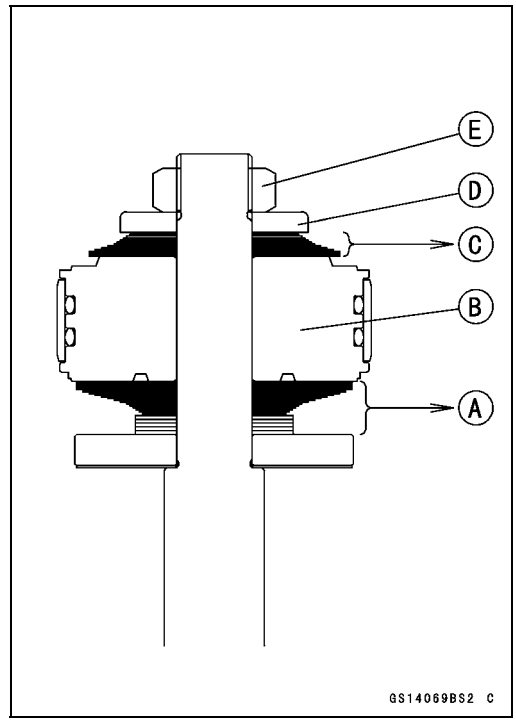


● Install:
Washer [A]
Stopper [B]



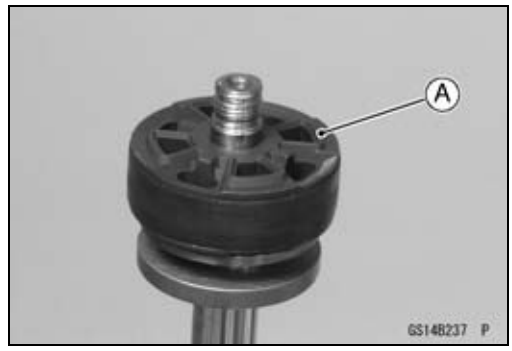
● Install:
Compression Side Washers [A]
Piston [B]
Rebound Side Washers [C]
Stopper [D]
New Locknut [E]

Torque - Piston Rod Locknut: 37 N·m (3.8 kgf·m, 27 ft·lb)

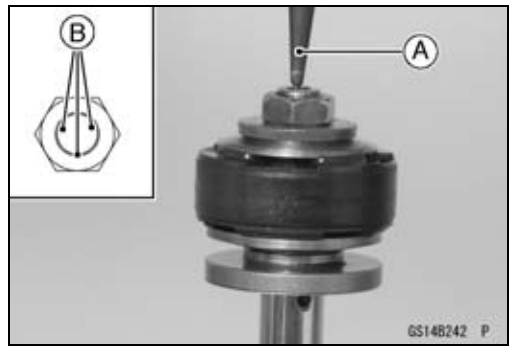


Periodic Maintenance Procedures

○Install the piston direction as shown in the figure.
Locknut Side Face [A]

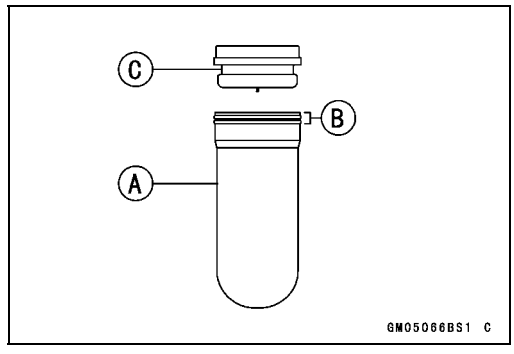


● Stake the end of the piston rod with the chisel [A] in three place [B].



● Check the oil seal assembly moving smoothly on the rod.

● Check that the bladder [A] on the gas reservoir cap is not partially collapsed.
★If it is, push down the valve core with a screwdriver.
● Check the bladder for sign of damage or crack.
★If necessary, replace it with a new one.



CAUTION

Do not use a damaged or partially collapsed bladder, because it may burst, gently reducing rear shock performance. .

● Apply grease to the lip [B] of the bladder and install the reservoir cap [C].

● Push the bladder into the gas reservoir slowly until it just clears the circlip groove. Wipe out any spilled oil.

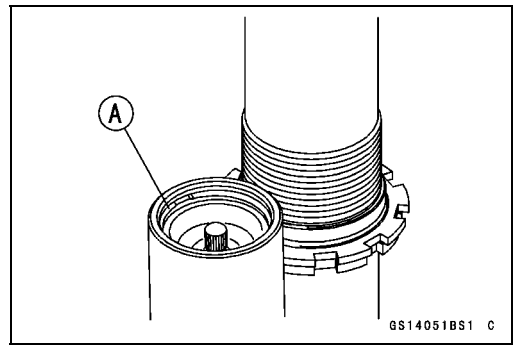
● Check the circlip for weakening, deformity and flaws.
★If necessary, replace it with a new one.

CAUTION

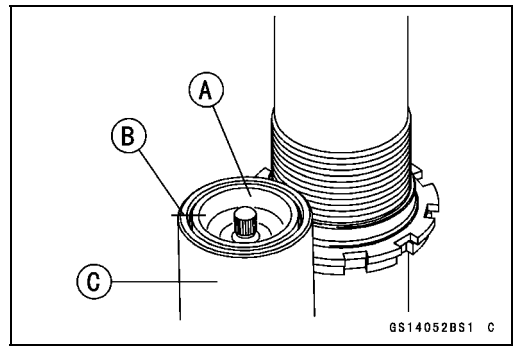
If weakened, deformed or flawed circlip is used, the gas reservoir cap may not hold when injecting the nitrogen gas. This would allow oil and internal parts to explode out of the reservoir.

Periodic Maintenance Procedures

● Mount the circlip [A] in the groove in the gas reservoir.



● Install the valve cap.
● Pull up the gas reservoir cap [A] against the circlip. The end of the gas reservoir cap must align [B] with the end of the gas reservoir [C].

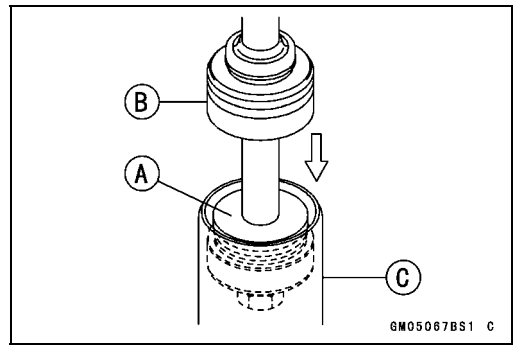


⚠ WARNING

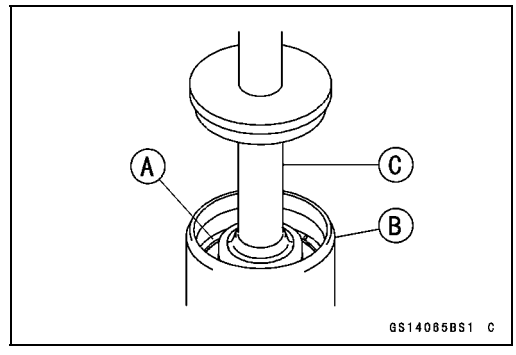
If the end of the gas reservoir cap and the end of the gas reservoir are not aligned, the circlip is not correctly fitting in the groove in the gas reservoir or is deformed. In this case, the oil and internal parts could explode out of the reservoir when injecting the nitrogen gas or while riding the motorcycle.

● Hold the upper portion of the rear shock absorber in a vise with soft jaws or a heavy cloth.

● Apply shock absorber oil to the bushing and O-ring of the piston rod assembly.
● Insert the piston end [A] of the piston rod assembly into the rear shock body [C] slowly. Do not insert the seal assembly [B] yet.



● Push the seal assembly into the rear shock body until it just clears the circlip groove.
● Check the circlip.
★If it is deformed or damaged, replace it with a new one.
● Fit the circlip [A] into the groove in the rear shock body [B].
● Pull up the piston rod assembly [C] against the circlip.

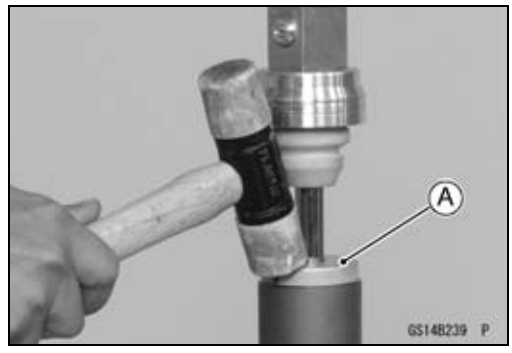


CAUTION

If the circlip is not a certain fit in the groove in the rear shock body, the piston rod assembly may come out of the shock absorber when injecting the nitrogen gas or riding the motorcycle.

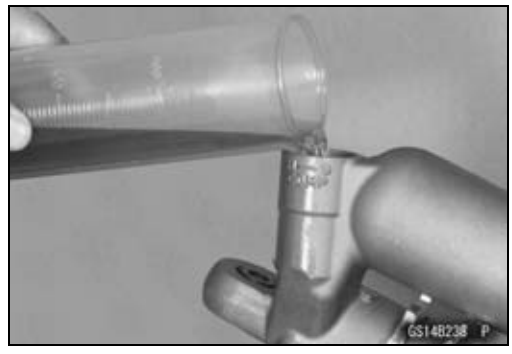
Periodic Maintenance Procedures

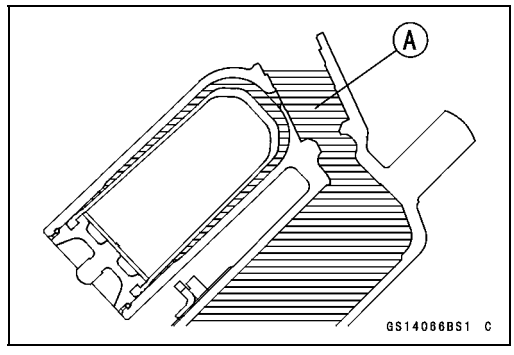
- Force the stopper [A] into the rear shock body by lightly tapping around the edge of the stopper with a mallet.
- Fully extend the piston rod assembly.



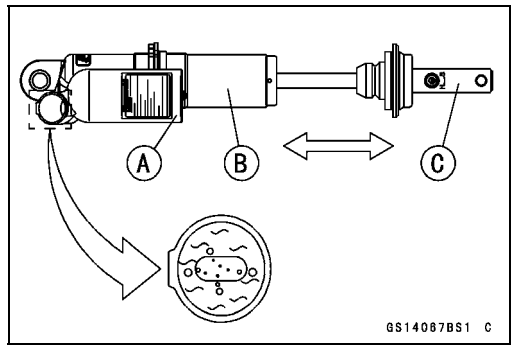
- Remount the upper portion of the shock absorber in a vise with soft jaws or a heavy cloth.
- Fill the specified oil [A] into the damping adjuster assembly hole.

Recommended Oil
SHOWA SS-25 or equivalent
Rear Shock Absorber Oil Capacity
Approximately 395 mL (13.4 US oz.)





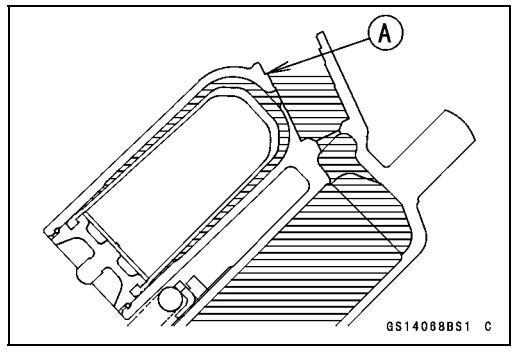
- Purge the air from between the gas reservoir [A] and rear shock body [B] by slowly pumping the piston rod [C] in and out.



- Add the specified oil up to the damping adjuster assembly hole neck [A].

NOTE

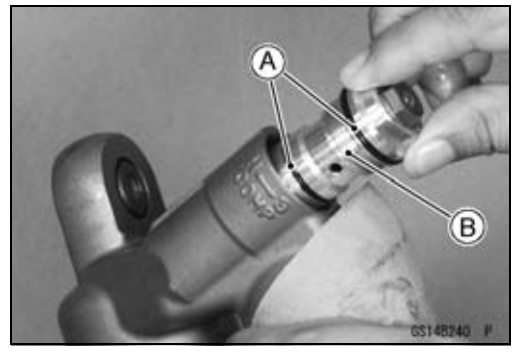
○*Hold the adjuster assembly hole facing up and turn the shock absorber to bleed the air from the reservoir [B] completely.*



Periodic Maintenance Procedures

- Inject nitrogen gas to a pressure of 50 kPa (0.5 kgf/cm², 7 psi) through the valve on the gas reservoir.
- Check the rear shock body and gas reservoir for oil and gas leaks.

★If there are leaks, reassemble the related parts.



- Replace the O-rings [A] with new ones and apply shock absorber oil.
- Install the gas reservoir damping adjuster assembly [B] securely.

○Slowly install the damping adjuster assembly.

Torque - Gas Reservoir Damping Adjuster Assembly: 29 N·m (3.0 kgf·m, 21 ft·lb)

- Fully extend the push rod assembly.
- Wipe off all oil from the shock absorber body and piston rod.
- Inject the nitrogen gas up to the 980 kPa (10 kgf/cm², 142 psi) pressure.

⚠ WARNING

Pressurize the gas reservoir with nitrogen gas only. Do not use air or other gases, since they may cause premature wear, rust, fire hazard or substandard performance.
High pressure gas is dangerous. Have a qualified mechanic perform this procedure.

- Install the spring and spring guide.
- Adjust spring preload. Reinstall the rear shock absorber.
- Install the parts removed.

Swingarm and Uni-Trak Linkage Inspection

- Check the uni-trak component parts for wear periodically, or whenever excessive play is suspected.
- Using the jack under the frame, raise the rear wheel off the ground.

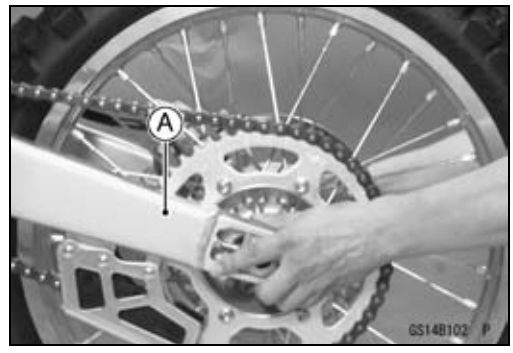
Special Tools - Jack: 57001-1238
Jack Attachment: 57001-1252 or 57001 -1608

- Pump the seat down and up [A] 4 or 5 times, and inspect the smooth stroke.

★If the uni-track linkage does not smooth stroke or noise is found, inspect the uni-track linkage bearings.

- Push and pull on the swingarm [A] to check for wear.

★A small amount of play on the swingarm is normal and no corrective action is needed. However, if excessive play is felt, remove the uni-trak parts from the frame and check for wear.



Swingarm and Uni-Track Linkage Pivot Lubrication

- Refer to the Swingarm Bearing Installation and Rocker Arm Bearing Installation in the Suspension chapter.

Steering

Steering Inspection

- Using the jack, raise the front wheel off the ground.

Special Tools - Jack: 57001-1238
Jack Attachment: 57001-1252 or 57001 -1608

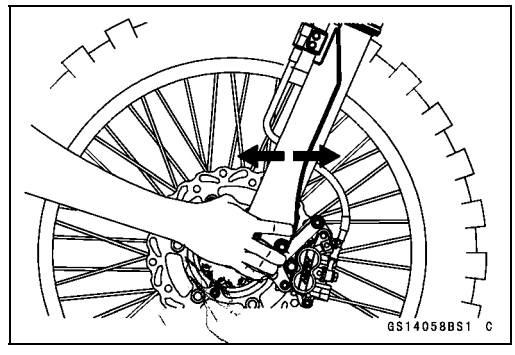
- With the front wheel pointing straight ahead, alternately nudge each end of the handlebar. The front wheel should swing fully left and right from the force of gravity until the fork hits the stop.

★If the steering binds or catches before the stop, check the routing of the cables, hoses, and harnesses.

★If the steering feels tight, adjust or lubricate the steering.

- Feel for steering looseness by pushing and pulling the forks.

★If you feel looseness, adjust the steering.



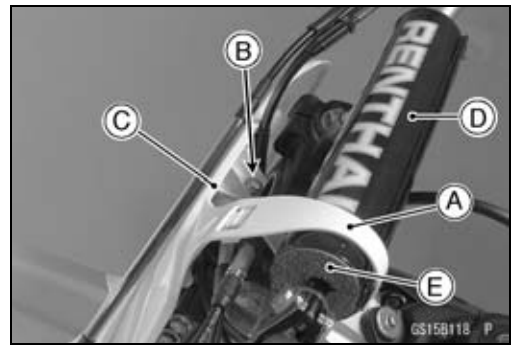
Steering Adjustment

- Using the jack, raise the front wheel off the ground.

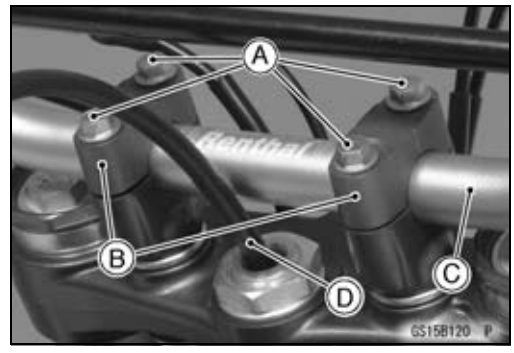
Special Tools - Jack: 57001-1238
Jack Attachment: 57001-1252 or 57001 -1608

Periodic Maintenance Procedures

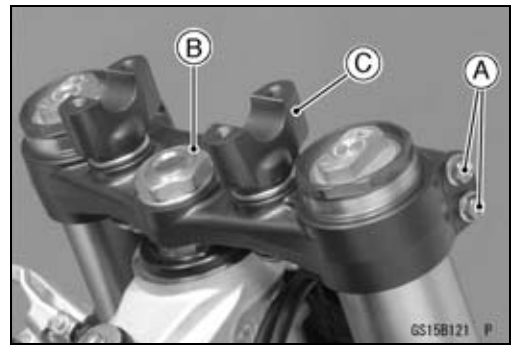
● Slide the holder belt [A] out off.
● Remove:
Number Plate Bolt [B]
Number Plate [C]
Handlebar Pad Cover [D]
Handlebar Pad [E]



● Remove:
Handlebar Holder Bolts [A]
Handlebar Holder [B]
Handle Bar [C]
Vent Tube [D]



● Loosen the front fork upper clamp bolts [A], and remove the steering stem head nut [B].
● Pull up the steering stem head [C] a little.

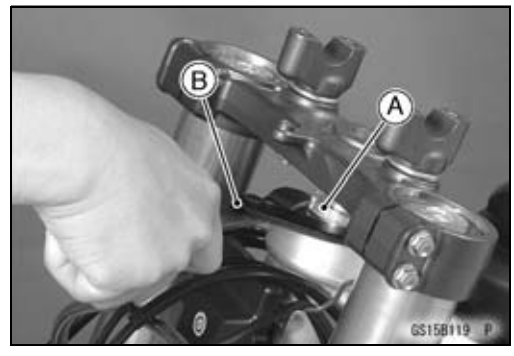


● Turn the steering stem locknut [A] with the steering stem nut wrench [B] to obtain the proper adjustment.
★If the steering is too tight, loosen the stem locknut a fraction of a turn; if the steering is too loose, tighten the locknut a fraction of a turn.

Special Tool - Steering Stem Nut Wrench: 57001-1100

NOTE

○*Turn the locknut 1/8 turn at a time maximum.*



● Push down the steering stem head.
● Tighten the following:
○Remove the upper clamp bolts and apply a non-permanent locking agent to the bolts.

Torque - Steering Stem Head Nut: 98 N·m (10 kgf·m, 72 ft·lb)
Front Fork Clamp Bolts (Upper): 20 N·m (2.0 kgf·m, 14.5 ft·lb)

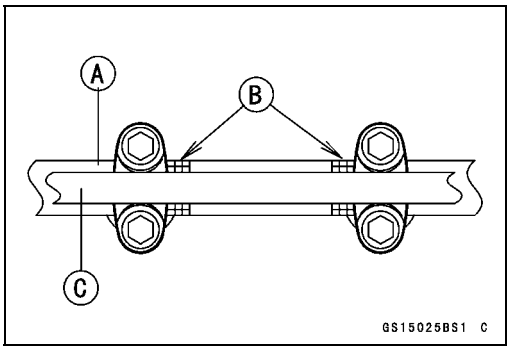
NOTE

○*Tighten the two holder bolts alternately two times to ensure even tightening torque.*

Periodic Maintenance Procedures

● Check the steering again.
★If the steering is too tight or too loose, repeat the adjustment as mentioned above.

● Install the handlebar [A] on the steering stem head as shown.
Same Length [B]
Bridge Bar [C]

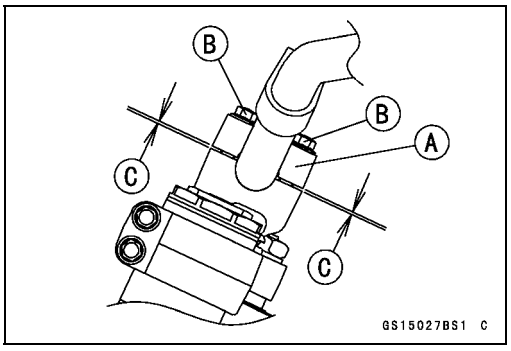


● Install the handlebar holders [A].
● Tighten the handlebar holder bolts [B].
○If the handlebar holder is correctly installed, there will be same a gap [C] at the front side and rear side.

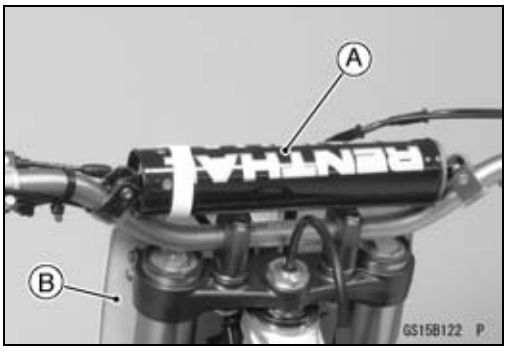
NOTE

○*Tighten the two holder bolts alternately two times to ensure even tightening torque.*

Torque - Handlebar Holder Bolts: 25 N·m (2.5 kgf·m, 18 ft·lb)

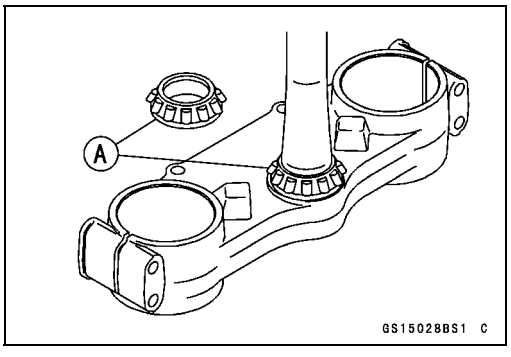


● Install the handlebar pat cover [A] as shown in the figure.
● Install the number plate [B].



Steering Stem Bearing Lubrication

● Remove the steering stem (see Steering Stem, Stem Bearing Removal in the Steering chapter).
● Using a high-flash-point solvent, wash the upper and lower tapered rollers in the cages, and wipe the upper and lower outer races, which are press-fitted into the frame head pipe, clean off grease and dirt.
● Visually check the outer races and the rollers.
★Replace the bearing assemblies if they show wear or damage.
● Pack the upper and lower tapered roller bearings [A] in the cages with grease, and apply a light coat of grease to the upper and lower outer races.
● Install the steering stem (see Steering Stem, Stem Bearing Removal in the Steering chapter)
● Adjust the steering (see Steering Adjustment).



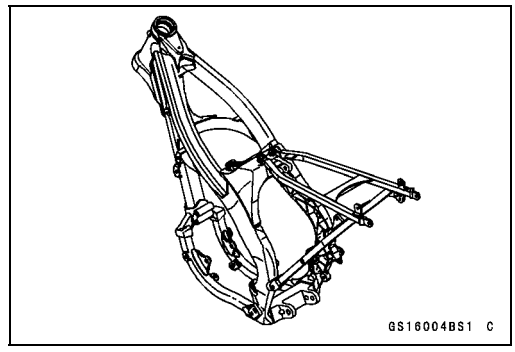
Periodic Maintenance Procedures

Frame

Frame Inspection

- Clean the frame with steam cleaner.
- Visually inspect the frame and rear frame for cracks, dents, bending, or warp.

★If there is any damage to the frame, replace it.



⚠ WARNING

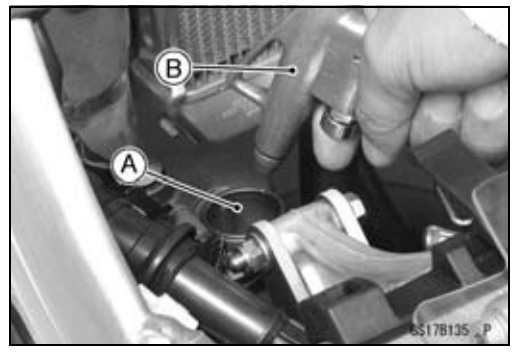
A repaired frame may fail in use, possibly causing an accident. If the frame is bent, dented, cracked, or warped, replace it.

Electrical System

Spark Plug Cleaning and Inspection

- Remove:
  Seat (see Seat Removal in the Frame chapter)
  Fuel Tank (see Fuel Tank Removal in the Fuel System chapter)
- Pull out the stick coil [A].

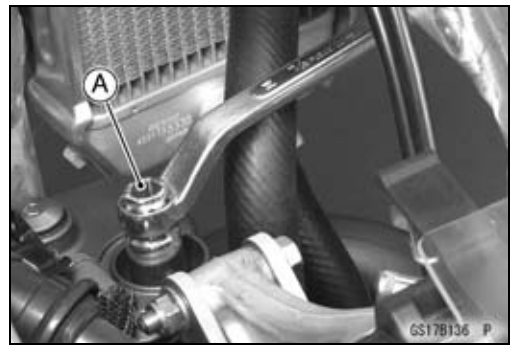
- Clean the plug hole [A], using the compressed air [B].



- Remove the spark plug, using the spark plug wrench.

  Special Tool - Spark Plug Wrench: 57001-1262

  Owner's Tool - Spark Plug Wrench, 16 mm: 92110-0002 [A]



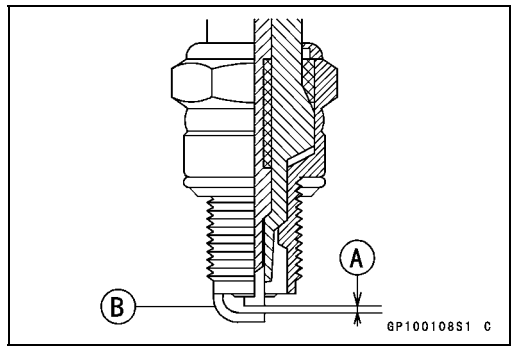
- Clean the spark plug, preferably in a sandblasting device, and then clean off any abrasive particles. The plug may also be cleaned using a high-flash-point solvent and a wire brush or other suitable tool.

★If the spark plug electrodes are corroded or damaged, or if the insulator is cracked, replace the plug. Use the standard spark plug.

Periodic Maintenance Procedures

● Measure the gap [A] with a wire-type thickness gauge.
★If the gap is incorrect, carefully bend the side electrode [B] with a suitable tool to obtain the correct gap.

Spark Plug Gap
Standard: 0.7 ~ 0.8 mm (0.028 ~ 0.031 in.)



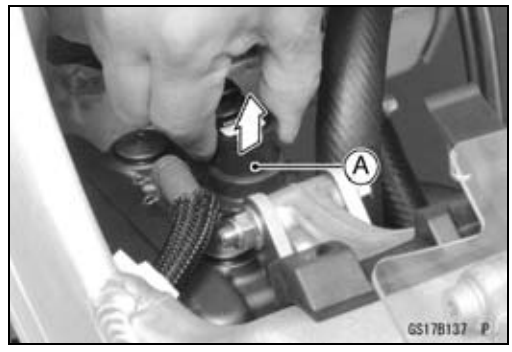
● Insert the spark plug in the plug wrench, and finger-tighten it first.
● Tighten the plug.

Torque - Spark Plug: 13 N·m (1.3 kgf·m, 113 in·lb)

Special Tool - Spark Plug Wrench: 57001-1262

Owner's Tool - Spark Plug Wrench, 16 mm: 92110-0002

● Fit the stick coil securely.
○Pull the stick coil [A] to make sure the installation of the stick coil.



Spark Plug Replacement
● Refer to the Spark Plug Cleaning and Inspection.

General Lubrication and Cable Inspection

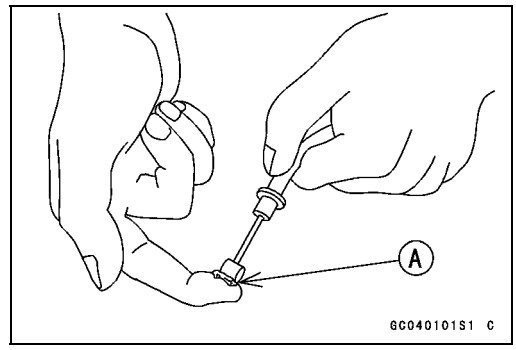
Lubrication
● Before lubricating each part, clean off any rusty spots with rust remover and wipe off any grease, oil, dirt, or grime.
● Lubricate the points listed below with indicated lubricant.

NOTE

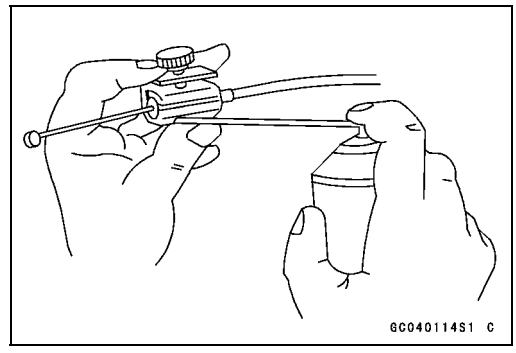
○*Whenever the vehicle has been operated under wet or rainy conditions, or especially after using a high-pressure water spray, perform the general lubrication.*

Periodic Maintenance Procedures

Points: Lubricate with Grease.
Clutch Inner Cable Upper and Lower Ends [A]
Hot Starter Inner Cable Upper End
Throttle Inner Cable Upper End
Brake Lever Pivot Bolt
Clutch Lever Pivot Bolt
Brake Pedal Mounting Bolt



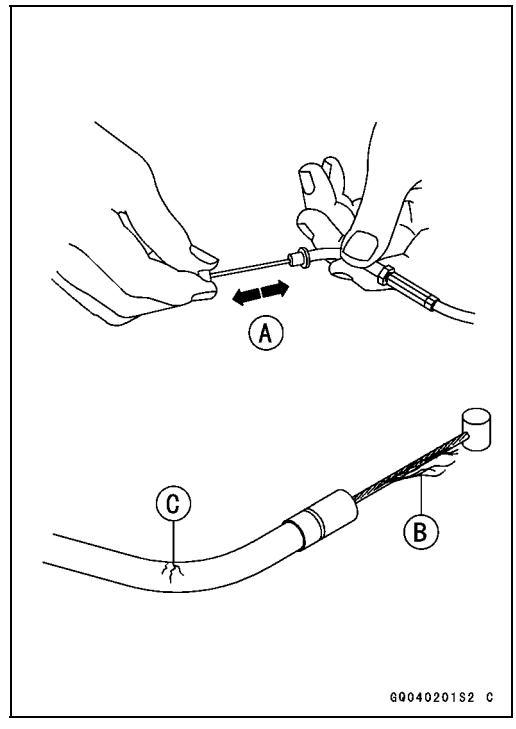
Cables: Lubricate with Rust Inhibitor.
Throttle Inner Cables
Clutch Inner Cable
Hot Starter Inner Cable



Pivots: Lubricate with engine oil.
Clutch Lever
Hot Starter Lever
Rear Master Cylinder Joint Pin

- With the cable disconnected at the both ends, the cable should move freely [A] within the cable housing.

★If cable movement is not free after lubricating, if the cable is frayed [B], or if the cable housing is kinked [C], replace the cable.



Nut, Bolt, and Fastener Tightness Inspection

Tightness Inspection

- Check the tightness of the bolts and nuts listed here in accordance with the Periodic Maintenance Chart. Also, check to see that each cotter pin is in place and in good condition.

NOTE

○*For the engine fasteners, check the tightness of them when the engine is cold (at room temperature).*

Periodic Maintenance Procedures

★If there are loose fasteners, retorque them to the specified torque following the specified tightening sequence. Refer to the Torque and Locking Agent section of the General Information chapter for torque specifications. For each fastener, first loosen it by 1/2 turn, then tighten it.
★If cotter pins are damaged, replace them with new ones.

Nut, Bolt and Fastener to be checked

Wheels:
- Spoke Nipples
- Front Axle Nut
- Front Axle Clamp Bolts
- Rear Axle Nut Cotter Pin
- Rear Axle Nut

Final Drive:
- Chain Adjuster Locknut
- Rear Sprocket Nuts

Brakes:
- Front Master Cylinder Clamp Bolts
- Brake Lever Pivot Nut
- Front Caliper Mounting Bolts
- Brake Pedal Mounting Bolt
- Rear Master Cylinder Push Rod Cotter Pin
- Rear Master Cylinder Mounting Bolts
- Rear Caliper Holder Shaft

Suspension:
- Front Fork Clamp Bolts
- Rear Shock Absorber Mounting Bolts, Nuts
- Swingarm Pivot Shaft Nut

Steering:
- Steering Stem Head Nut
- Handlebar Holder Bolts

Engine:
- Throttle Cable Adjuster Locknuts
- Engine Mounting Bolts, Nuts
- Shift Pedal Bolt
- Muffler Mounting Bolts
- Exhaust Pipe Holder Nuts
- Muffler Pipe Clamp Bolt
- Clutch Cable Adjuster Locknut
- Clutch Lever Pivot Nut

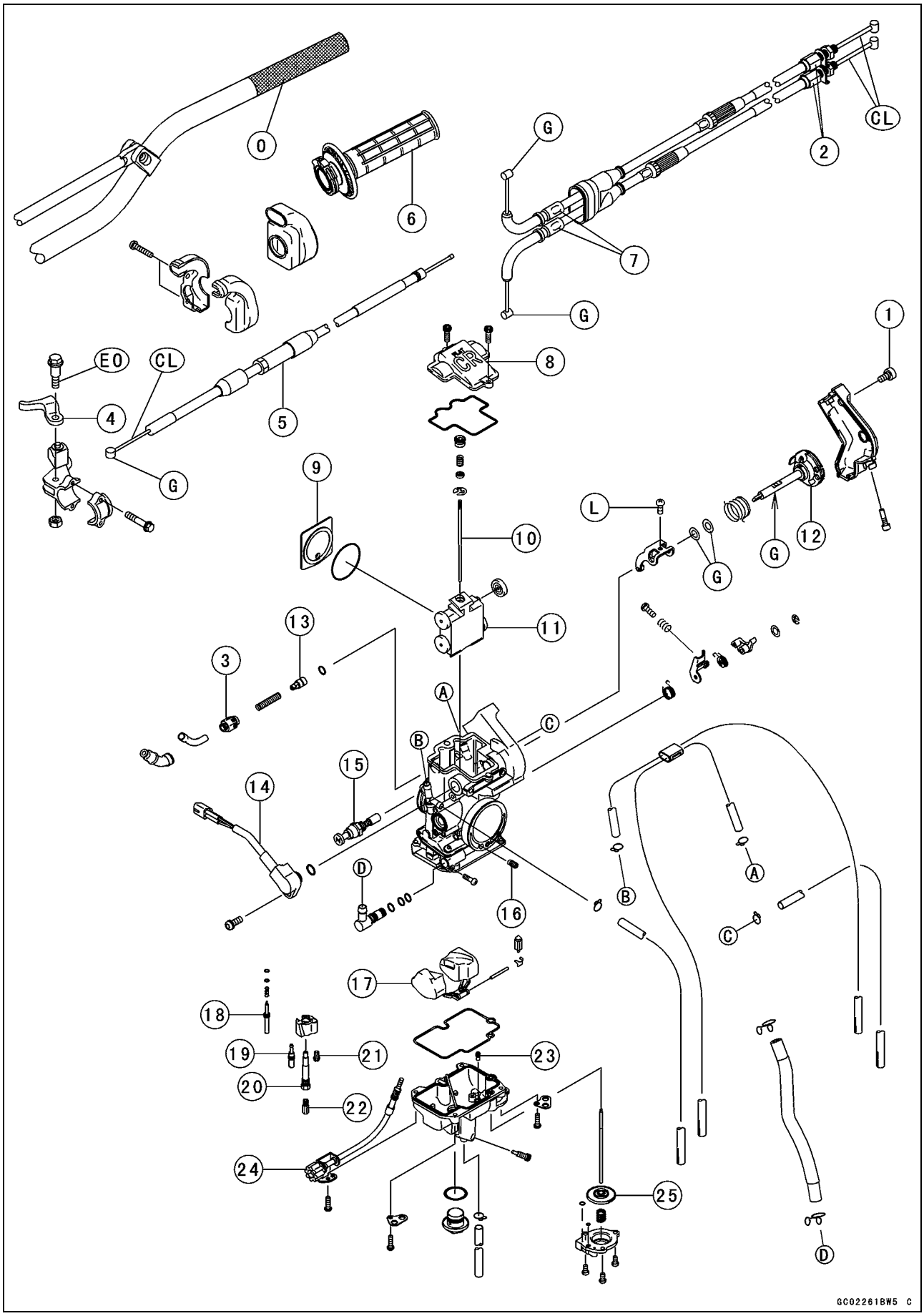
Others:
- Footpeg Cotter Pins
- Rear Frame Mounting Bolts
- Front Fender Bolts

Fuel System

Table of Contents

Exploded View 3-2
Specifications 3-6
Special Tool 3-7
Throttle Grip and Cable 3-8
Throttle Grip (Throttle Cable) Free Play Inspection 3-8
Throttle Grip (Throttle Cable) Free Play Adjustment 3-8
Throttle Cable Replacement 3-8
Throttle Cable Lubrication 3-10
Throttle Cable Inspection 3-10
Hot Starter Cable Removal 3-10
Hot Starter Cable Installation 3-11
Hot Starter Lever (Hot Starter Cable) Free Play Inspection 3-11
Hot Starter Lever (Hot Starter Cable) Free Play Adjustment 3-11
Hot Starter Cable Lubrication 3-11
Hot Starter Cable Inspection 3-11
Carburetor 3-12
Idle Speed Inspection 3-12
Idle Speed Adjustment 3-12
Service Fuel Level Inspection 3-12
Service Fuel Level Adjustment 3-13
Carburetor Removal 3-14
Carburetor Installation 3-16
Fuel Inspection 3-17
Carburetor Disassembly 3-18
Carburetor Cleaning 3-21
Carburetor Inspection 3-22
Carburetor Assembly 3-23
Air Cleaner 3-29
Air Cleaner Housing Removal 3-29
Air Cleaner Housing Installation 3-29
Element Removal 3-29
Element Installation 3-30
Element Cleaning and Inspection 3-30
Fuel Tank 3-31
Fuel Tank Removal 3-31
Fuel Tank Installation 3-31
Fuel Tap Removal 3-32
Fuel Tap Installation 3-32
Fuel Tank and Tap Cleaning 3-32
Fuel Tap Inspection 3-32

Exploded View



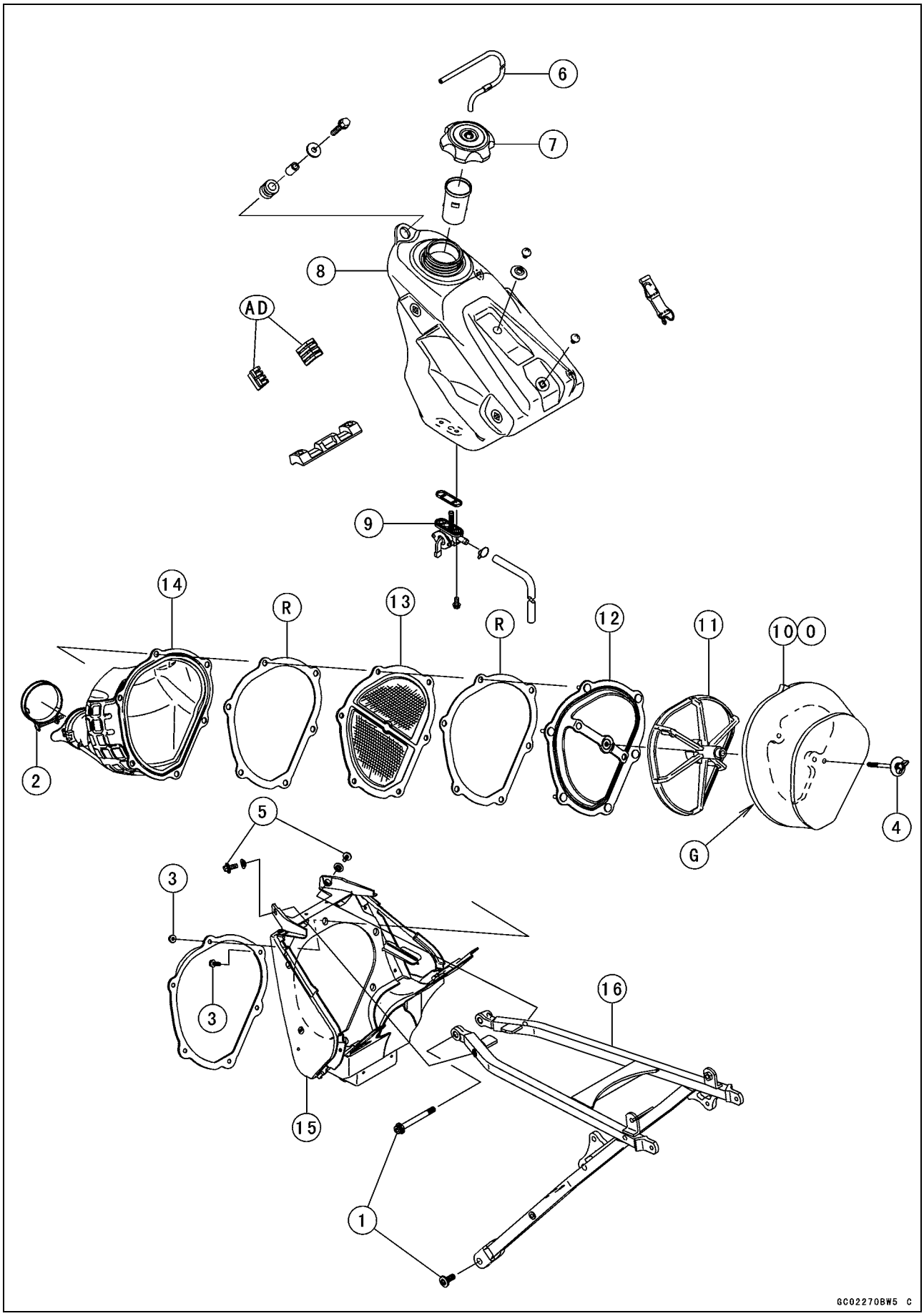
Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Throttle Pulley Cover Bolt	3.4	0.35	30 in·lb	
2	Throttle Cable Bolts	7.0	0.7	61 in·lb	
3	Hot Starter Plunger Cap Bolt	1.0	0.1	10 in·lb	

4. Hot Starter Lever
5. Hot Starter Cable
6. Throttle Grip
7. Throttle Cables
8. Carburetor Cap
9. Throttle Valve Plate
10. Jet Needle
11. Throttle Valve
12. Throttle Pulley Shaft
13. Hot Starter Plunger
14. Throttle Sensor
15. Choke Knob
16. Slow Air Jet
17. Float
18. Pilot Air Screw
19. Slow Jet
20. Needle Jet
21. Starter Jet
22. Main Jet
23. Leak Jet
24. Idle Adjusting Screw
25. Acceleration Pump Diaphragm

CL Apply cable lubricant.
G: Apply grease.
L: Apply a non-permanent locking agent.
O: Apply 2 stroke oil.

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Rear Frame Mounting Bolts	34	3.5	25	
2	Air Cleaner Duct Clamp Screw	3.0	0.3	27 in·lb	
3	Air Cleaner Duct Bolt and Nuts	3.0	0.3	27 in·lb	
4	Air Cleaner Element Wing Bolt	–	–	–	Hand Tighten
5	Air Cleaner Housing Bolts	9.8	1.0	87 in·lb	

6. Breather Tube
7. Fuel Tank Cap
8. Fuel Tank
9. Fuel Tap
10. Element
11. Frame
12. Holder
13. Flame Arrester
14. Air Cleaner Duct
15. Air Cleaner Housing
16. Rear Frame

AD: Apply adhesive cement.
G: Apply grease.
O: High-quality foam-air-filter oil.
R: Replacement Parts.

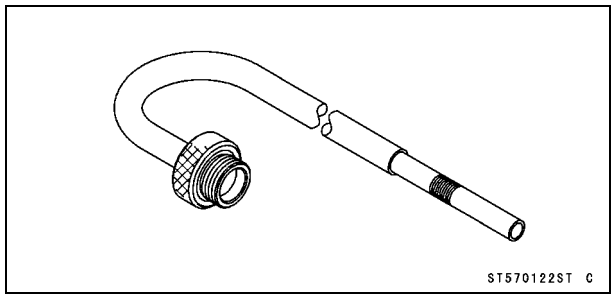
Specifications

Item	Standard	Service Limit
Carburetor		
Make/Type	KEIHIN FCR-MX37	– – –
Starter Jet	#68	– – –
Leak Jet	#55	– – –
Main Jet	#180 (KX250T6F), (EUR) #175 #182 (KX250T7F ~),	– – –
Throttle Valve Cutaway	CA 1.5	– – –
Jet Needle	NCYU, (EUR) NHJU (KX250T6F ~ 7F) NCYU (KX250T8F)	– – –
Jet Needle Clip Position	2nd groove from the top, (EUR) 3rd groove from the top (KX250T6F) 4th groove from the top, (EUR) 1st groove from the top (KX250T7F ~)	– – –
Slow Jet	#40	– – –
Slow Air Jet	#100	– – –
Pilot Air Screw (turns out)	2 1/8	– – –
Service Fuel Level (below the bottom edge of the carb. body)	6.5 ±1 mm (0.256 ±0.04 in.)	– – –
Float Height	8 ±1 mm (0.315 ±0.04 in.)	– – –

EUR: Europe Model

Special Tool

Fuel Level Gauge, M18 × 1.0:
57001-122



Throttle Grip and Cable

If the throttle grip has excessive free play due to cable stretch or misadjustment, there will be a delay in throttle response. Also, the throttle valve may not open fully at full throttle. On the other hand, if the throttle grip has no play, the throttle will be hard to control, and the idle speed will be erratic. Check the throttle grip play periodically in accordance with the Periodic Maintenance Chart, and adjust the play if necessary.

The throttle cable routing is shown in Cable, Wire, and Hose Routing in the Appendix chapter.

Throttle Grip (Throttle Cable) Free Play Inspection

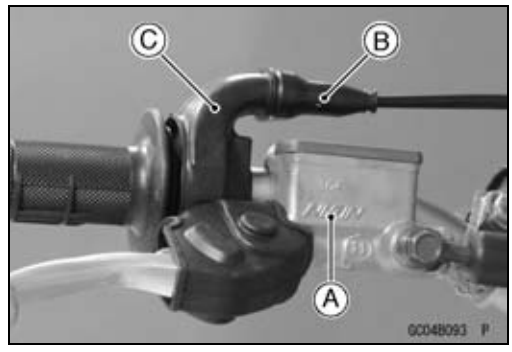
- Refer to the Throttle Grip (Throttle Cable) Free Play Inspection in the Periodic Maintenance chapter.

Throttle Grip (Throttle Cable) Free Play Adjustment

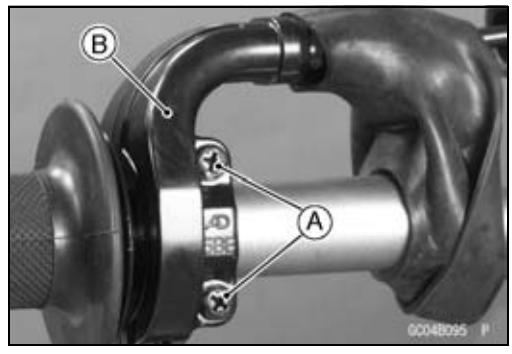
- Refer to the Throttle Grip (Throttle Cable) Free Play Adjustment in the Periodic Maintenance chapter.

Throttle Cable Replacement

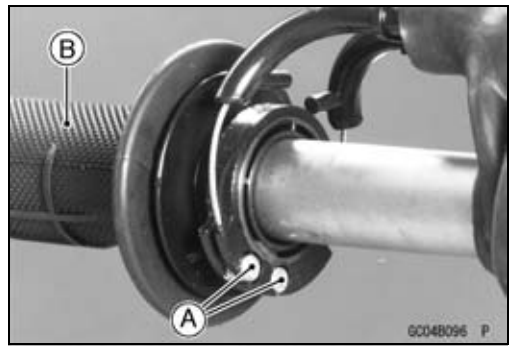
- Remove the front master cylinder [A] (see Front Master Cylinder Removal in the Brakes chapter).
- Slide out the dust cover [B].
- Pull out the cable housing dust cover [C].



- Unscrew the screws [A].
- Separate the throttle cable housing [B].

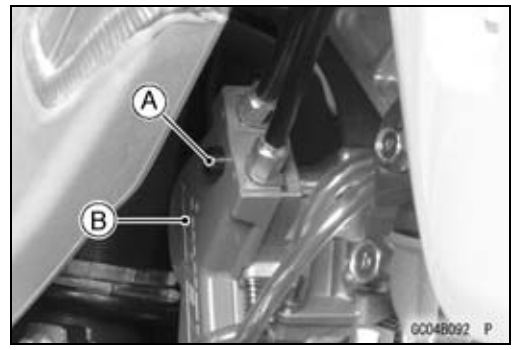


- Free the tips [A] from the grip [B].

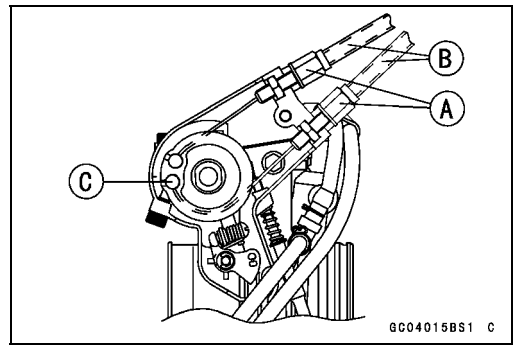


Throttle Grip and Cable

- Unscrew the bolt [A].
- Remove the throttle pulley cover [B].



- Loosen the mounting bolts [A].
- Remove the throttle cables [B] from the carburetor.
- Free the tips [C] from the pulley.
- Remove the throttle cables from the frame.

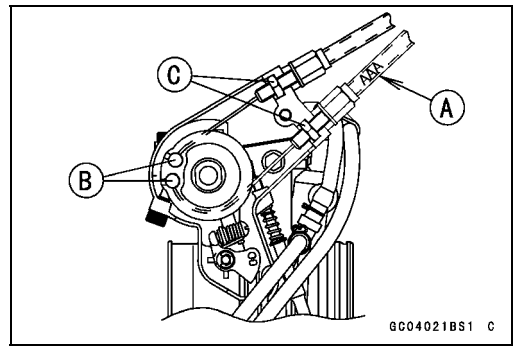


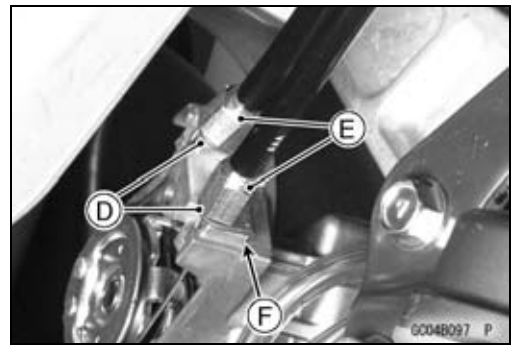
- Lubricate the throttle cable.
- Apply grease to the tips of the throttle cables.
- Install the throttle cable lower end as shown.

○For the marked [A] cable is accelerator.
○Install the cable tips [B].
○Set the nuts [C] to the holder.
○Set the washers [D] so that the stopper position [F] is inside.
○Tighten the bolts [E].

- Install the throttle pulley cover.

Torque - Throttle Cable Bolts: 7.0 N·m (0.7 kgf·m, 61 in·lb)
Throttle Pulley Cover Bolt: 3.4 N·m (0.35 kgf·m, 30 in·lb)





- Install the throttle cable in accordance with the Cable, Wire, and Hose Routing section in the Appendix chapter.
- After the installation, adjust each cable properly.

⚠ WARNING

Operation with an incorrectly routed or improperly adjusted cable could result in an unsafe riding condition.

Throttle Grip and Cable

Throttle Cable Lubrication

- Whenever the throttle cable is removed or in accordance with the Periodic Maintenance Chart, lubricate the these cables, Refer to General Lubrication in the Periodic Maintenance Chapter.

○Apply a thin coating of grease to the cable upper end.

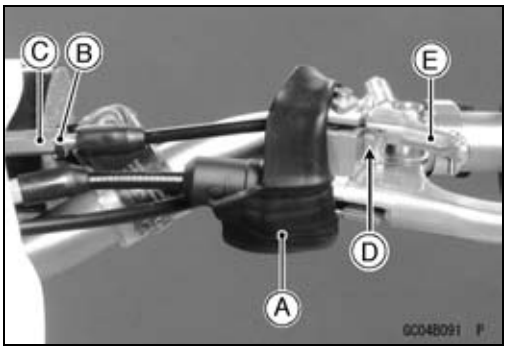
○Use a commercially available pressure cable lubricator to lubricate these cables.

Throttle Cable Inspection

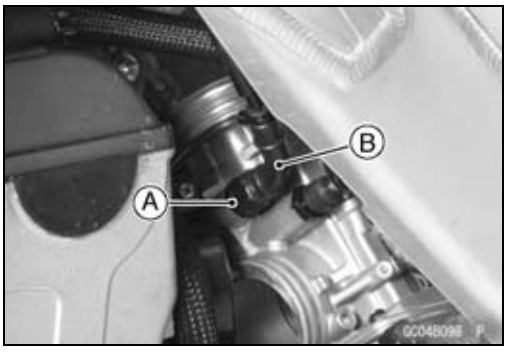
- Refer to the Cable Inspection in the Periodic Maintenance chapter.

Hot Starter Cable Removal

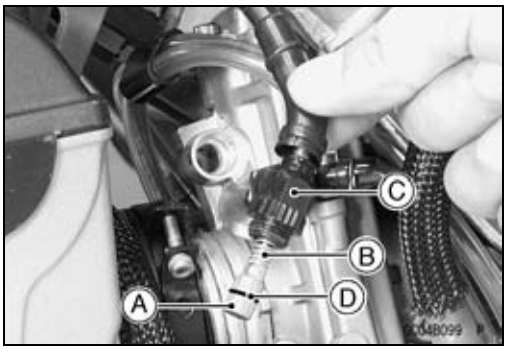
- Remove:
  Dust Cover [A] (Slide out)
  Locknut [B] (Loosen)
- Turn in the adjuster [C] fully.
- Remove the cable end [D] from the hot starter lever [E].



- Remove:
  Carburetor (Inlet side out)
- Unscrew the plunger cap bolt [A] and remove the cable end [B].

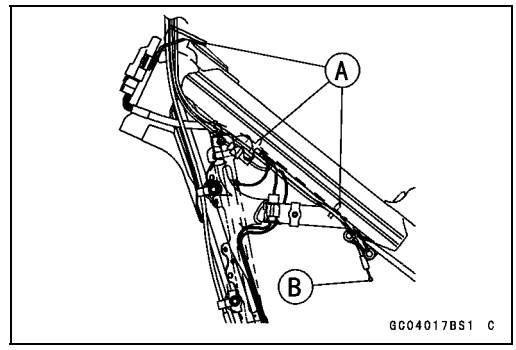


- Disassemble the cable end from the plunger [A].
  Spring [B]
  Plunger Cap Assy [C]
  O-Ring [D]



Throttle Grip and Cable

- Remove:
  Fuel Tank (see Fuel Tank Removal)
- Pull out the cable [B] from the clamps [A].



Hot Starter Cable Installation

Torque - Hot Starter Plunger Cap Bolt: 1.0 N·m (0.1 kgf·m, 10 in·lb)

- Install the hot starter cable in accordance with the Cable, Wire and Hose Routing section in the appendix chapter.
- After the installation, adjust the cable properly.

⚠ WARNING

Operation with an incorrectly routed or improperly adjusted cable could result in an unsafe riding condition.

Hot Starter Lever (Hot Starter Cable) Free Play Inspection

- Refer to the Hot Starter Lever (Hot Starter Cable) Free Play Inspection in the Periodic Maintenance chapter.

Hot Starter Lever (Hot Starter Cable) Free Play Adjustment

- Refer to the Hot Starter Lever (Hot Starter Cable) Free Play Inspection in the Periodic Maintenance chapter.

Hot Starter Cable Lubrication

- Whenever the hot starter cable is removed or in accordance with the Periodic Maintenance Chart, lubricate the these cable. Refer to General Lubrication in the Periodic Maintenance chapter.

Hot Starter Cable Inspection

- Refer to the Cable Inspection in the Periodic Maintenance chapter.

Carburetor

Since the carburetor regulates and mixes the fuel and air going to the engine, there are two general types of carburetor trouble: too rich a mixture (too much fuel), and too lean a mixture (too little fuel). Such trouble can be caused by dirt, wear, maladjustment, or improper fuel level in the float chamber. A dirty or damaged air cleaner can also alter the fuel to air ratio.

Idle Speed Inspection

- Refer to the Idle Speed Inspection in the Periodic Maintenance chapter.

Idle Speed Adjustment

- Refer to the Idle Speed Adjustment in the Periodic Maintenance chapter.

Service Fuel Level Inspection

⚠ WARNING

Gasoline is extremely flammable and can be explosive under certain conditions. Always stop the engine and do not smoke. Make sure the area is well ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.

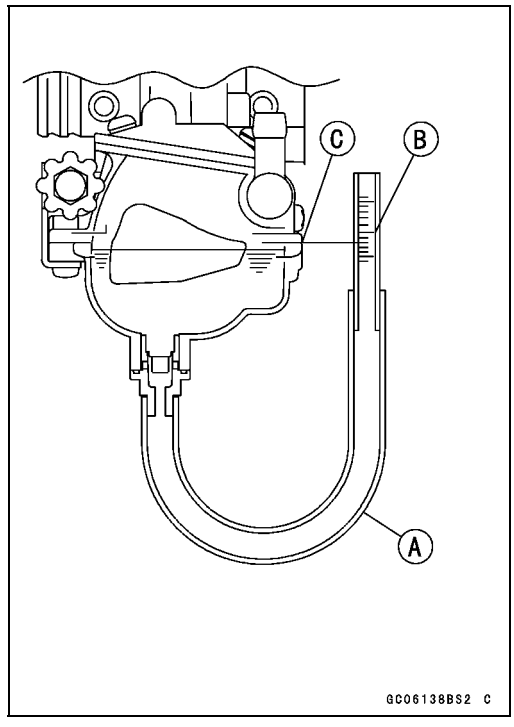
- Turn the fuel tap to the OFF position.
- Remove the fuel tank.
- Remove the carburetor, and hold it in true vertical position on a stand. The fuel hose and carburetor cable do not have to be removed to inspect the fuel level.
- Put the fuel tank on a bench, and connect the fuel tap to the carburetor using a suitable hose.
- Remove the drain plug from the bottom of the float bowl, and screw a fuel level gauge [A] into the plug hole.

Special Tool - Fuel Level Gauge: 57001-122

- Hold the gauge vertically against the side of the carburetor body so that the “zero” line [B] is several millimeters higher than the bottom edge [C] of the carburetor body.
- Turn the fuel tap to the ON position to feed fuel to the carburetor.
- Wait until the fuel level in the gauge settles.
- Keeping the gauge vertical, slowly lower the gauge until the “zero” line is even with the bottom edge of the carburetor body.

NOTE

○*Do not lower the “zero” line below the bottom edge of the carburetor body. If the gauge is lowered and then raised again, the fuel level measure shows somewhat higher than the actual fuel level. If the gauge is lowered too far, dump the fuel out of it into a suitable container and start the procedure over again.*

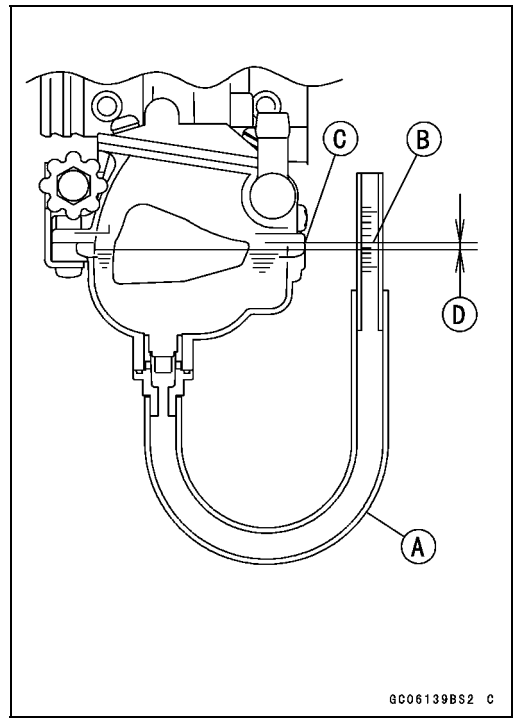


Carburetor

- Read the fuel level [D] in the gauge and compare it to the specification.

Service Fuel Level (below the bottom edge of the carb. body)
Standard: 6.5 ±1 mm (0.256 ±0.04 in.)

★If the fuel level is incorrect, adjust it.
- Turn the fuel tap to the OFF position and remove the fuel level gauge.
- Install the drain plug on the bottom of the float bowl.

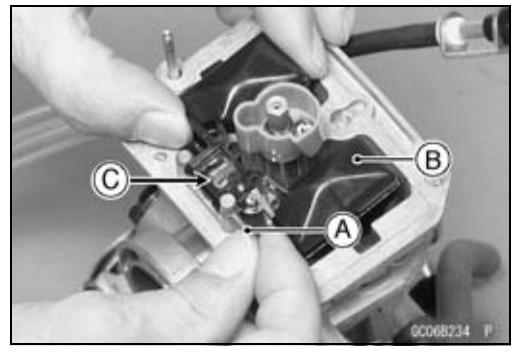


Service Fuel Level Adjustment

⚠ WARNING

Gasoline is extremely flammable and can be explosive under certain conditions. Always stop the engine and do not smoke. Make sure the area is well-ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.

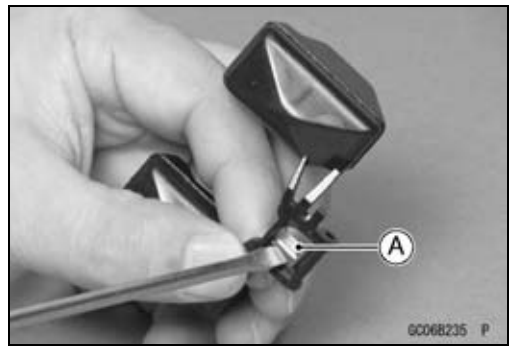
- Remove the carburetor, and drain the fuel into a suitable container.
- Remove the float bowl (see Carburetor Disassembly).
- Drive out the pivot pin [A] and remove the float [B] with valve needle [C].



Carburetor

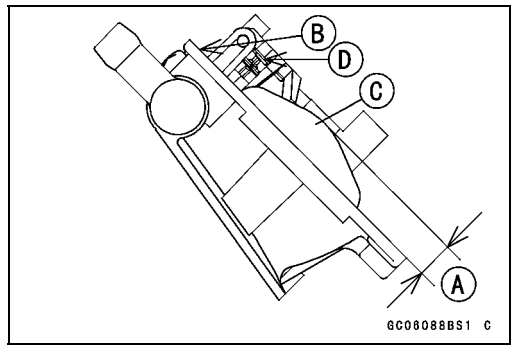
● Bend the tang [A] on the float arm very slightly to change the float height. Increasing the float height lowers the fuel level and decreasing the float height raises the fuel level.

Float Height
Standard: 8 ±1 mm (0.315 ±0.039 in.)



NOTE

○*Float height [A] is the distance from the float bowl mating surface [B] of the carburetor body (with the gasket removed) to the top of the float [C]. Measure the height with the carburetor upside down.*
○*Do not push the needle rod [D] in during the float height measurement.*



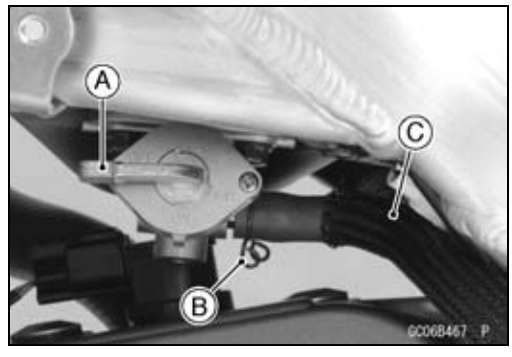
● Assemble the carburetor, and recheck the fuel level.
★If the fuel level cannot be adjusted by this method, the float or the float valve is damaged.

Carburetor Removal

⚠ WARNING

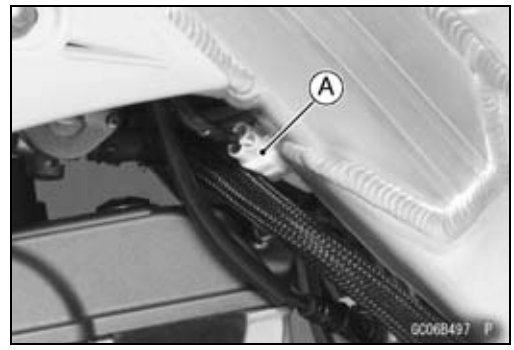
Gasoline is extremely flammable and can be explosive under certain conditions. Always stop the engine and do not smoke. Make sure the area is well-ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.

● Turn the fuel tap lever [A] to the OFF position.
● Slid off the clamp [B] and pull the fuel hose [C] off the tap.

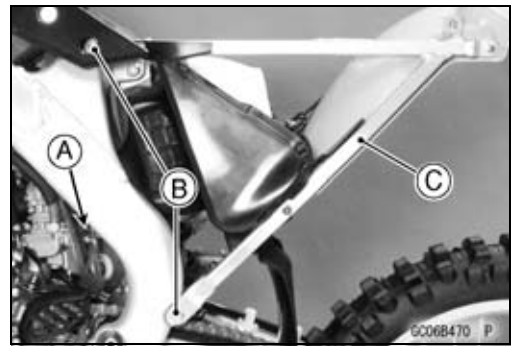


Carburetor

- Disconnect the throttle sensor connector [A].

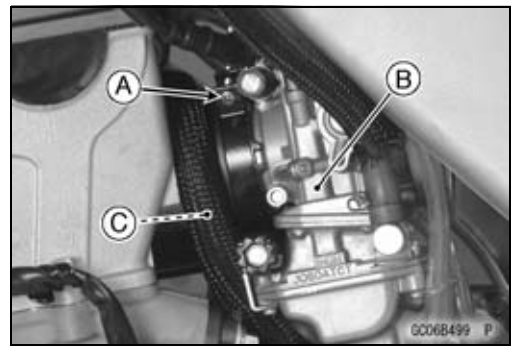


- Remove:
  Seat
  Side Cover
  Muffler
  Rear Frame Bolts [B]
- Loosen the clamp screws [A] of the air cleaner duct.
- Pull out the rear frame [C] with the air cleaner housing.



○Lift up the rear frame little and then pass the end position [A] of the duct between the frame and shock absorber as shown.

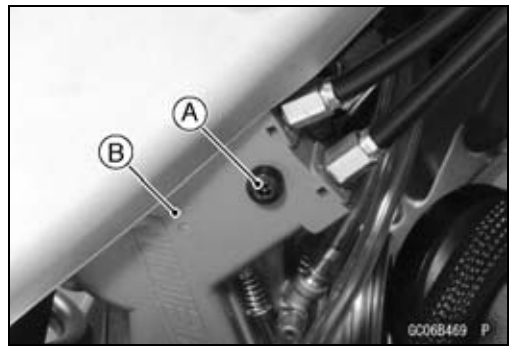
- Loosen the clamp screw [A] and remove the carburetor [B] from the carburetor holder [C].



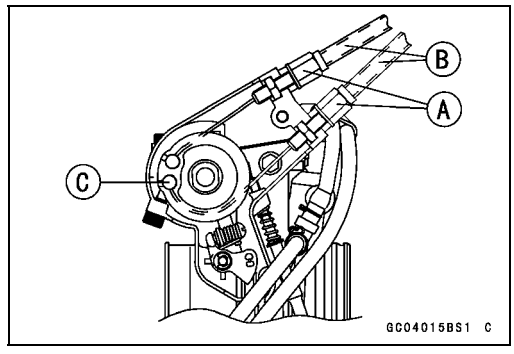
- Unscrew the hot starter plunger cap bolt [A].
- Remove the hot starter plunger.

Carburetor

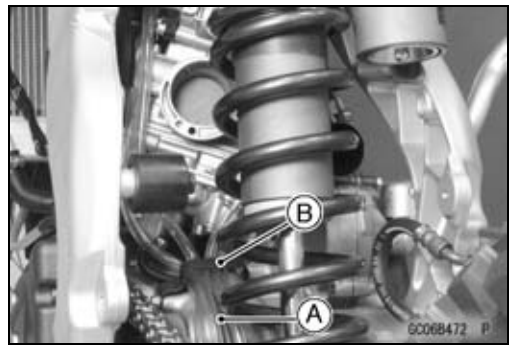
- Unscrew the throttle pulley cover bolt [A].
- Remove the throttle pulley cover [B].



- Loosen the mounting bolts [A].
- Pull out the end of the throttle cables [B].
- Free the tips [C].



- Pull out the air vent tubes and drain tube [A] from the clamp [B].
- Remove the carburetor to the left side of the frame.
- Drain the fuel from the float bowl by removing the drain plug. After draining, install the drain plug securely.
- After removing the carburetor, push a clean, lint-free towel into the carburetor holder and the air cleaner duct to keep dirt or other foreign material from entering.



⚠ WARNING

If dirt or dust is allowed to pass through into the carburetor, the throttle may become stuck, possibly causing an accident.

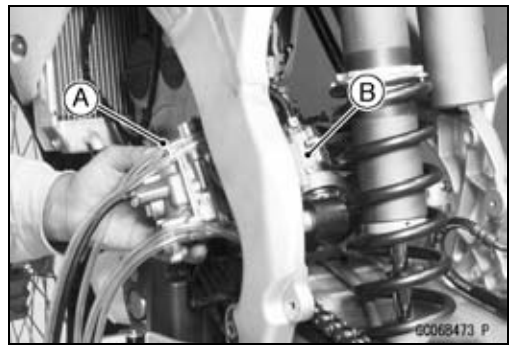
CAUTION

If dirt gets through into the engine, excessive engine wear and possibly engine damage will occur.

Carburetor Installation

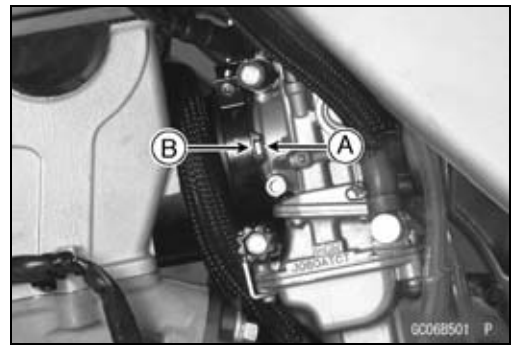
- Insert the carburetor [A] from the upper side [B].
- Install:
  Throttle Cables (see Throttle Cable Replacement)
  Hot Starter Plunger (see Hot Starter Cable Installation)
- Tighten:

Torque - Throttle Pulley Cover Bolt: 3.4 N·m (0.35 kgf·m, 30 in·lb)
Throttle Cable Bolts: 7.0 N·m (0.7 kgf·m, 61 in·lb)



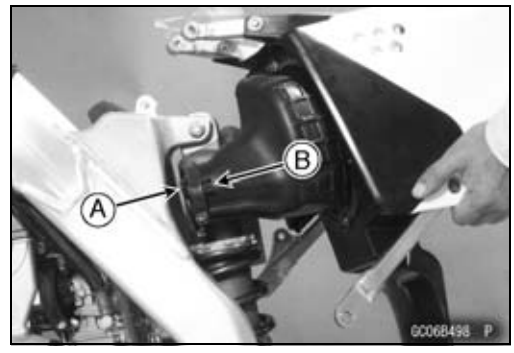
Carburetor

● When installing the carburetor into the carburetor holder, fit the projection [A] of the carburetor with the groove [B] on the holder.



● Fit the claw [A] of the clamp onto the groove [B] of the inlet duct.
● Insert the duct end between the frame and shock absorber.
● Install the Rear frame upper bolt temporary.
● Insert the duct end onto the carburetor.
● Tighten the clamps securely.

Torque - Carburetor Holder Clamp Screw : 2.0 N·m (0.2 kgf·m, 17 in·lb)
Air Cleaner Duct Clamp Screw: 3.0 N·m (0.3 kgf·m, 27 in·lb)



● Route the air vent and overflow hoses properly (see Cable, Wire, and Hose Routing section in the Appendix chapter).

CAUTION

Always keep the hoses free of obstruction, and make sure they do not get pinched by the chain or shock absorber.

● Connect the throttle sensor connector.
● After installing the carburetor, do the following.
○Turn the fuel tap to the ON position, and check for fuel leakage from the carburetor.

⚠ WARNING

Fuel spilled from the carburetor is hazardous.

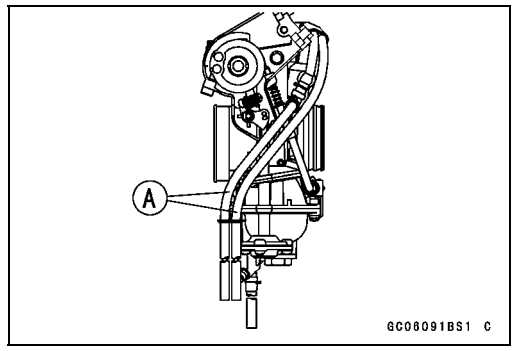
○Adjust the following items if necessary:
Throttle Cable
Idle Speed (see Idle Speed Adjustment in the Periodic Maintenance chapter)

Fuel Inspection
● Refer to the Fuel Inspection in the Periodic Maintenance chapter.

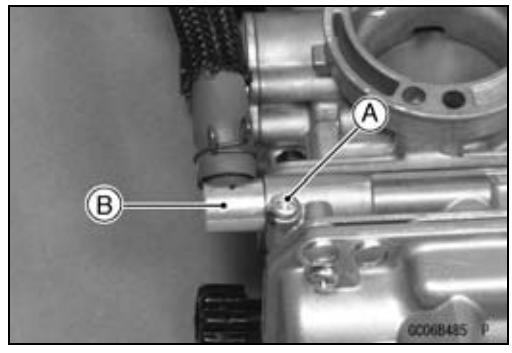
Carburetor

Carburetor Disassembly

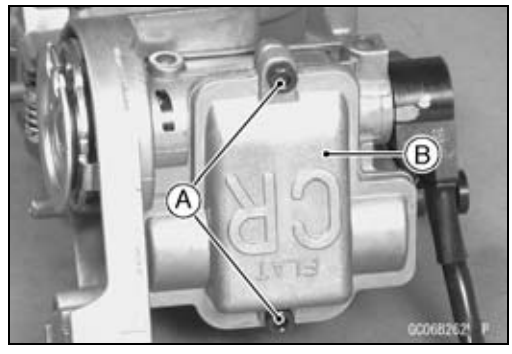
- Remove the carburetor.
- Remove all vent tubes [A].



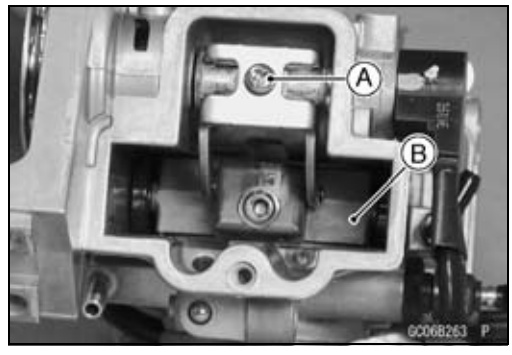
- Unscrew the screw [A].
- Pull out the fuel hose fitting [B].



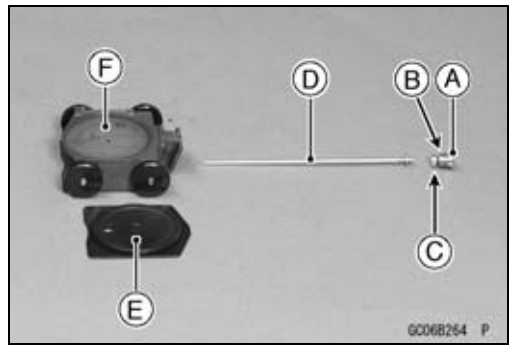
- Unscrew the carburetor cap bolts [A].
- Remove the carburetor cap [B].



- Unscrew the throttle valve link screw [A].
- Pull out the throttle valve assembly [B].

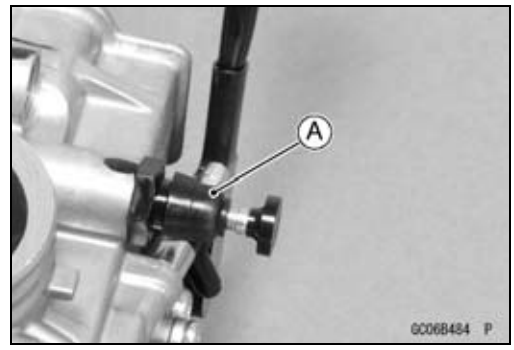


- Disassemble the throttle valve assembly; jet needle holder [A] (unscrew), spring [B], retainer [C], jet needle with circlip [D], O-ring with throttle valve plate [E] and throttle valve [F].

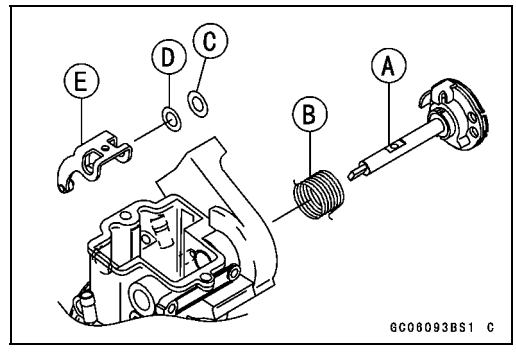


Carburetor

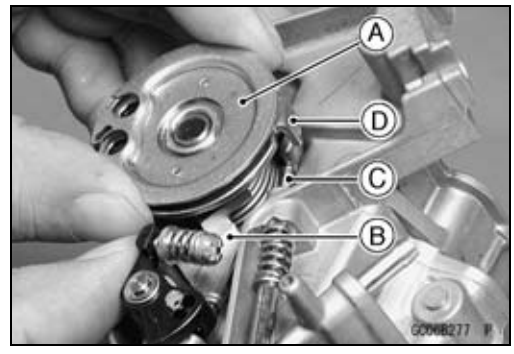
- Remove the choke knob/starter plunger assembly [A] from the carburetor.



- Remove the throttle pulley shaft [A] with the spring [B], steel washer [C], plastic washer [D] and throttle valve link [E].



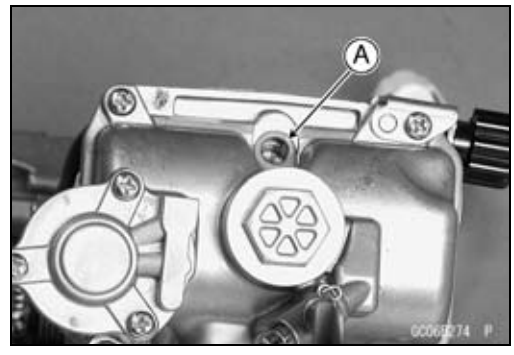
○Turn the throttle pulley shaft [A] clockwise while holding down the acceleration pump lever [B] and clear the idle stop screw [C] to the stopper [D] of the pulley.



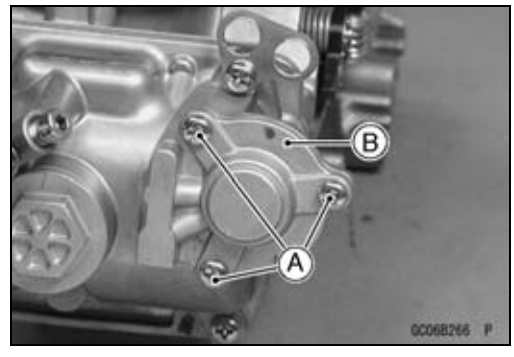
- Turn in the pilot air screw [A] fully but not tightly and count the number of turns.

○Record this number as the manufacture-set number of turns out.

- Unscrew the pilot air screw.

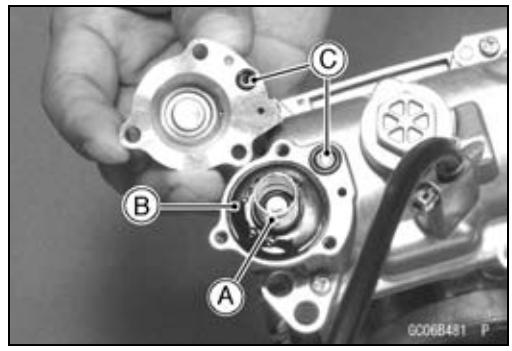


- Unscrew the screws [A].
- Remove the acceleration pump cover [B] from the carburetor.

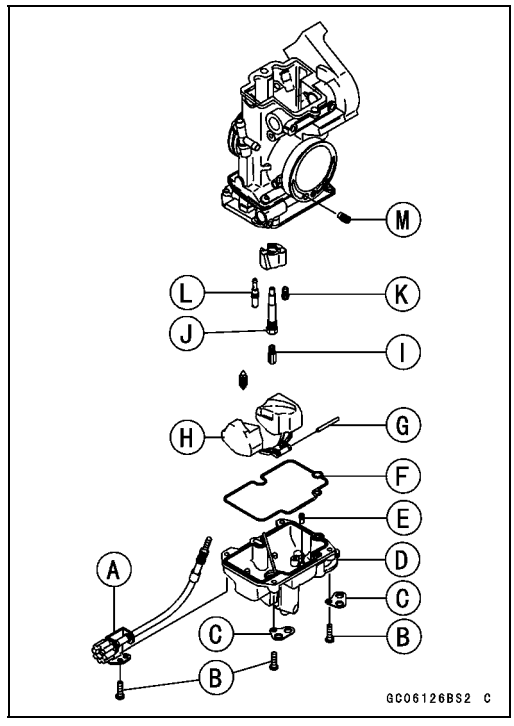


Carburetor

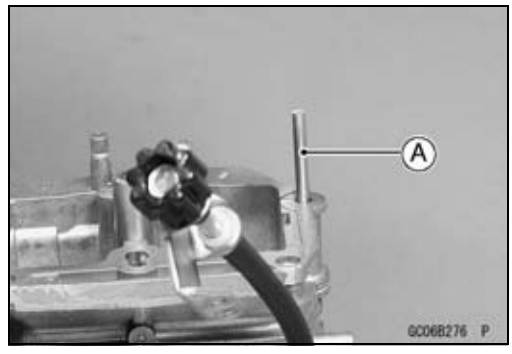
- Remove the spring [A], diaphragm [B], and the O-rings [C].



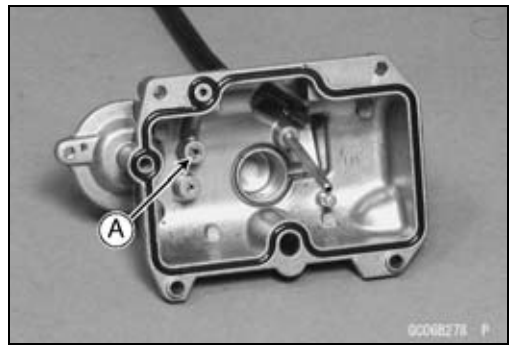
- Remove the following parts from the carburetor body.
  [A] Idle Adjusting Screw
  [B] Screws
  [C] Clamps
  [D] Float Bowl
  [E] Leak Jet
  [F] O-ring
  [G] Pin
  [H] Float
  [I] Main Jet
  [J] Needle Jet
  [K] Starter Jet
  [L] Pilot Jet
  [M] Pilot Air Jet



- Pull out the push rod [A] of the acceleration pump.

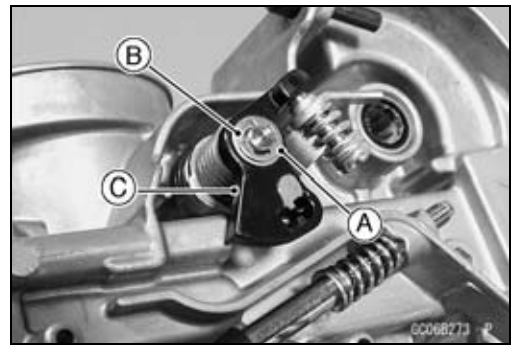


- Unscrew the leak jet [A].

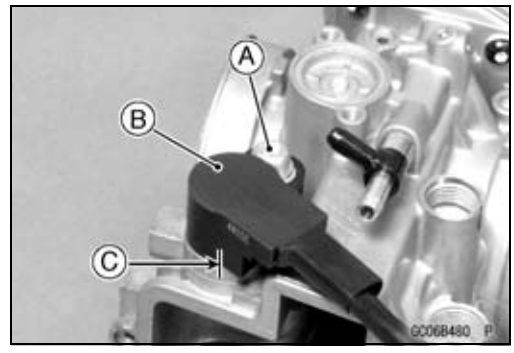


Carburetor

- Remove:
  E-clip [A]
  Washer [B]
- Pull out the acceleration pump lever assembly [C] as a set.



- Remove the throttle sensor mounting bolt [A].
- Before removing the throttle sensor [B], mark [C] the carburetor body and sensor so that it can be installed later in the same position.



Carburetor Cleaning

⚠ WARNING

Clean the carburetor in a well-ventilated area, and take care that there is no spark or flame anywhere near the working area; this includes any appliance with a pilot light. Because of the danger of highly flammable liquids, do not use gasoline or low flash -point solvent to clean the carburetor.

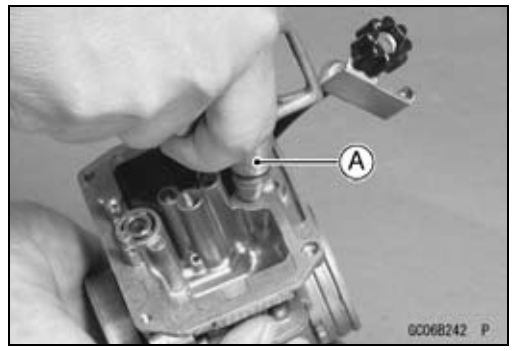
- Make sure the fuel tap is in the OFF position.
- Remove the carburetor (see Carburetor Removal).
- Drain the fuel in the carburetor.
- Disassemble the carburetor (see this chapter).

CAUTION

Do not use compressed air on an assembled carburetor, the float may be deformed by the pressure.
Remove as many rubber or plastic parts from the carburetor as possible before cleaning the carburetor with a cleaning solution. This will prevent damage or deterioration of the parts. Do not use a strong carburetor cleaning solution which could attack the plastic parts; instead, use a mild high flash-point cleaning solution safe for plastic parts.
Do not use wire or any other hard instrument to clean carburetor parts, especially jets, as they may be damaged.

Carburetor

- Immerse all the metal parts in a carburetor cleaning solution.
- Rinse the parts in water.
- After the parts are cleaned, dry them with compressed air.
- Blow through the air and fuel passages with compressed air [A].
- Assemble the carburetor, and install it on the motorcycle.



Carburetor Inspection

⚠ WARNING

Gasoline is extremely flammable and can be explosive under certain conditions. Always stop the engine and do not smoke. Make sure the area is well-ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.

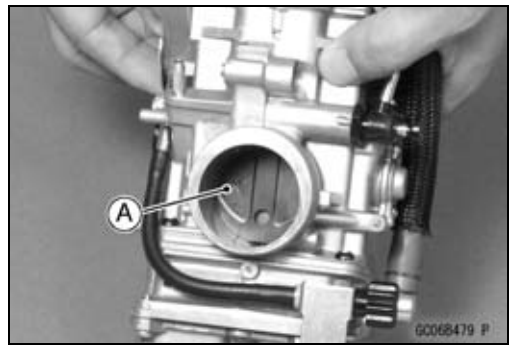
- Remove the carburetor.
- Before disassembling the carburetor, check the fuel level (see Fuel Level Inspection).

★If the fuel level is incorrect, inspect the rest of the carburetor before correcting it.

- Turn the throttle pulley to check that the throttle valve [A] moves smoothly and returns by spring pressure.

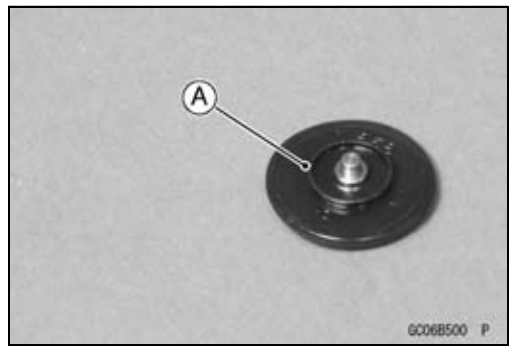
★If the throttle valve does not move smoothly. Replace the throttle valve or pulley spring.

- Disassemble the carburetor.
- Clean the carburetor.



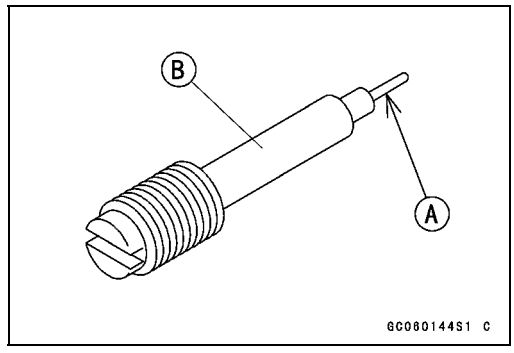
- Check the diaphragm [A] on the acceleration pump for pinholes, deterioration or other damage.

★If the diaphragm is not in good condition, replace it.



- Check the tapered portion [A] of the pilot screw [B] for wear or damage.

★If the pilot screw is worn or damaged on the tapered portion , it will prevent the engine from idling smoothly. Replace it.



Carburetor

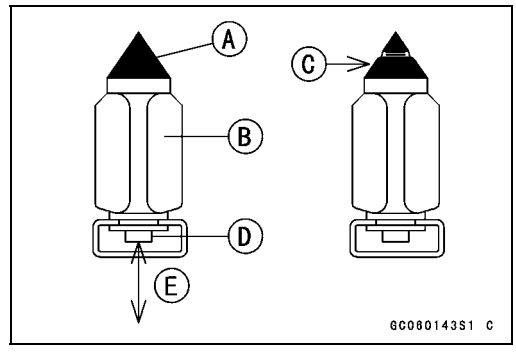
- Remove the float valve needle.
- Check the plastic tip [A] of the float valve needle [B] for wear.

★If the needle is worn as shown right [C], replace the valve needle.

- Push the rod [D] in the valve needle, then release it.

★If the rod does not come out fully by spring tension, replace the valve needle.

Push and release [E]



- Remove the starter jet.
- Check the slow jet for any damage.

★If the slow jet is damaged, replace it with a new one.

- Remove the throttle valve and jet needle.
- Inspect the outside of the throttle valve and plate for scratches and abnormal wear.

★If it is badly scratched or worn, replace the throttle valve or plate.

- Inspect the inside of the carburetor body for these same faults.

★If it is badly scratched or worn, replace the entire carburetor.

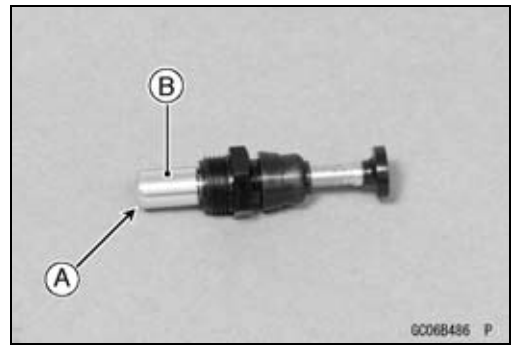
- Check the jet needle for wear.

★A worn jet needle should be replaced.

- For the throttle sensor inspection, see Throttle Sensor Inspection in the Electrical System chapter.
- Check the valve seat [A] of the choke plunger [B] for damage or stepped wear.

★Replace the choke knob assembly if necessary.

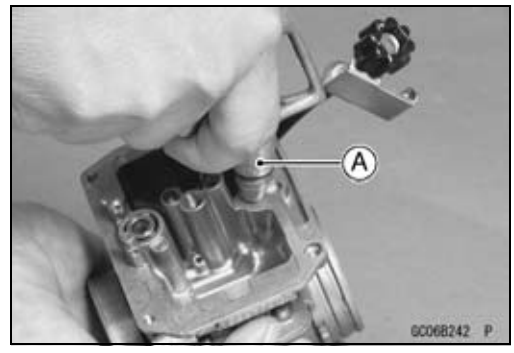
- Clean the fuel and air passages with a high flash-point solvent and compressed air.



Carburetor Assembly

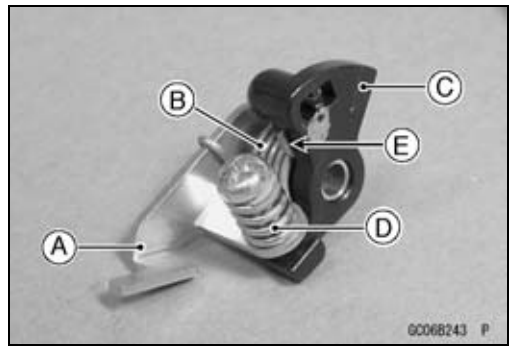
- Clean the disassembly parts before assembling.

○Clean the fuel and air passages with a high flash-point solvent and compressed air [A].

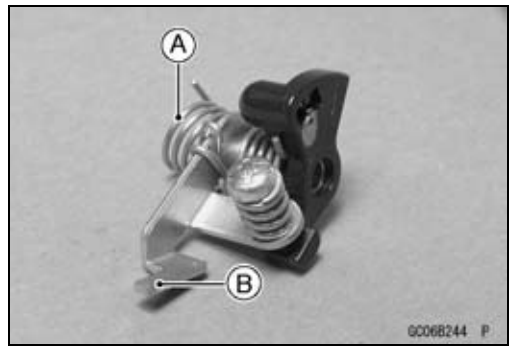


Carburetor

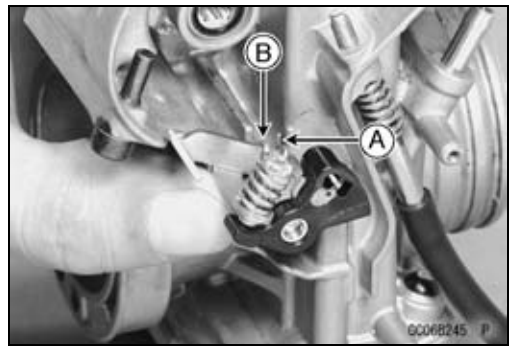
● Set up the acceleration pump lever assembly as shown.
Acceleration Pump Lever [A]
Spring [B]
Push Rod Holder [C]
Adjusting Screw with Spring [D]
○Fit the spring end on the stopper [E] of the push rod holder.



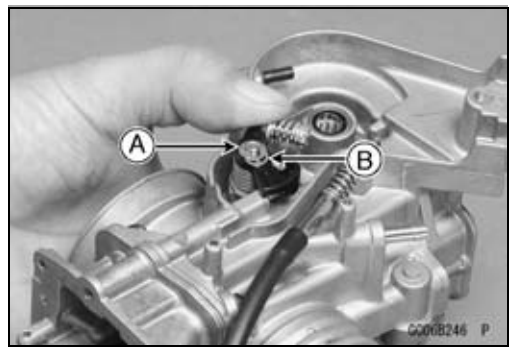
● Install the return spring [A] to the acceleration pump lever [B].



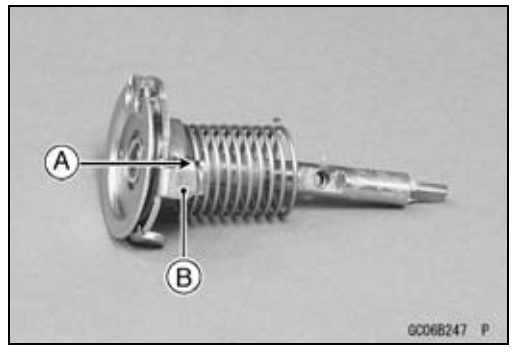
● Install the acceleration pump lever assembly to the carburetor body.
○Fit the end [A] of the return spring into the recess [B] on the carburetor body.



● Install:
Washer [A]
E-clip [B]

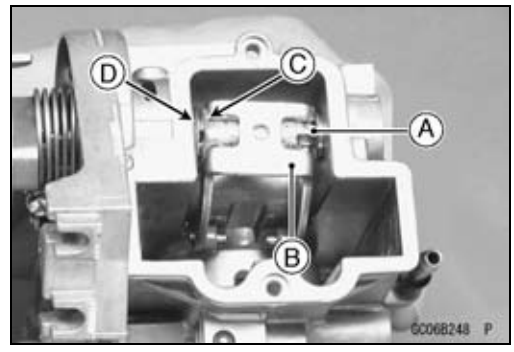


● Apply thin coat silicone grease to the shaft.
● Fit the hook [A] of the return spring onto the stopper [B] of the throttle cable pulley.

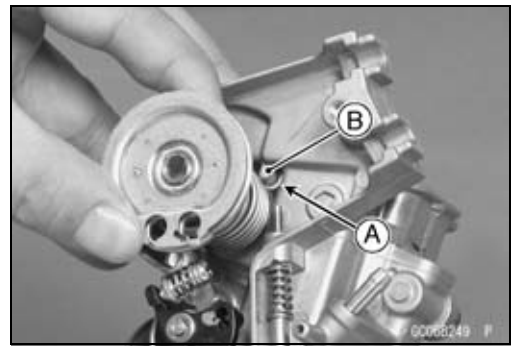


Carburetor

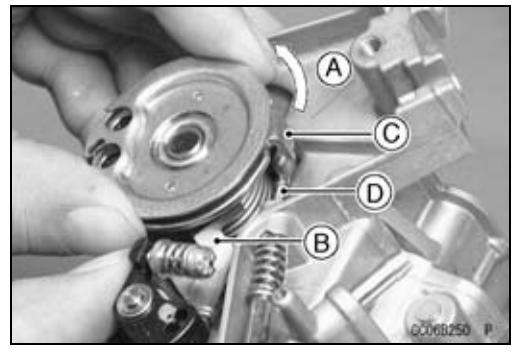
● Insert the throttle cable pulley shaft [A] and install the steel washer [D], nylon washer [C] and valve link [B].



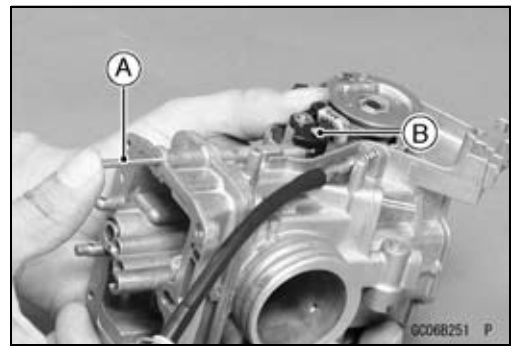
○Fit the end [A] of the return spring into the recess [B] of the carburetor body.



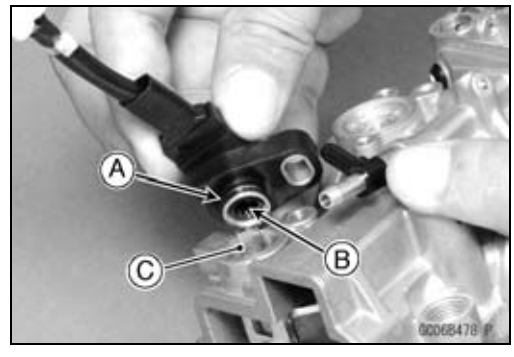
● Turn the pulley counterclockwise [A] while holding down the acceleration pump lever [B] and clear the stopper [C] of the pulley from the throttle stop screw head [D].



● Install the push rod [A] into the push rod holder [B].

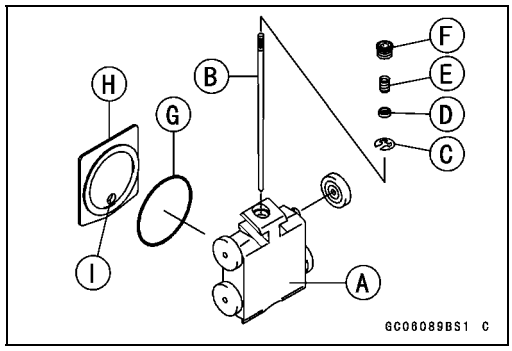


● Apply a grease to the O-ring [A].
● Fit the stopper [B] of the throttle sensor onto the projection [C] on the throttle cable pulley shaft.
○Install the throttle sensor so that the marks aligns and check it position (see Throttle Sensor Inspection in the Electrical System chapter).

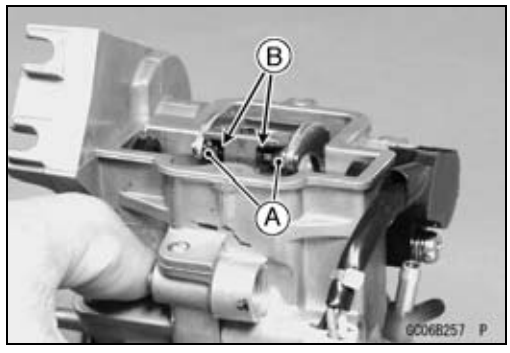


Carburetor

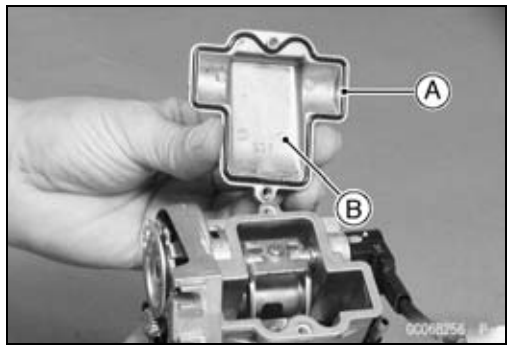
● Assemble:
Throttle Valve [A]
Jet Needle [B]
Circlip [C] (Refer to Specifications for position.)
Retainer [D]
Spring [E]
Jet Needle Holder [F]
O-ring [G]
Throttle Valve Plate [H]
○Assemble the valve plate so that the hole side downward [I].



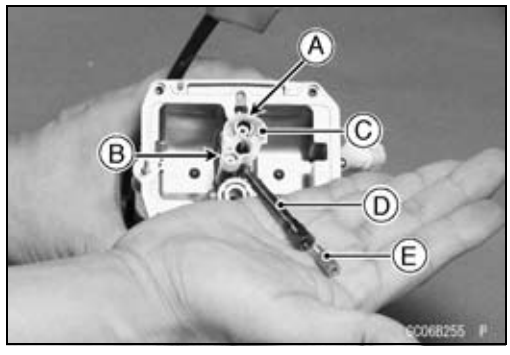
● Apply a non-permanent locking agent to the link screw.
● Insert the throttle valve assembly.
○Insert the link rollers [A] on the throttle link into the slits [B] of the throttle valve.
● Tighten the screw.



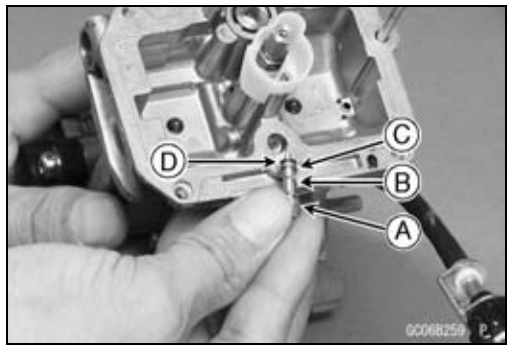
● Install:
O-ring [A]
Carburetor Cap [B]
Bolts (tighten)



● Install:
Starter Jet [A]
Pilot Jet [B]
Baffle Plate [C]
Needle Jet [D]
Main Jet [E]

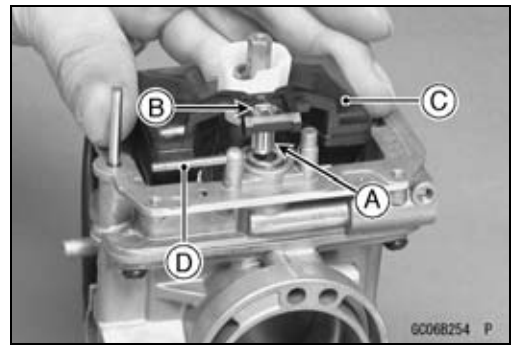


● Replace the O-ring with new one.
● Install:
Pilot Air Screw [A]
Spring [B]
Washer [C]
O-ring [D]
○Turn in the pilot air screw fully but not tightly, and the back it out the counted number of turn (see Carburetor Disassembly).

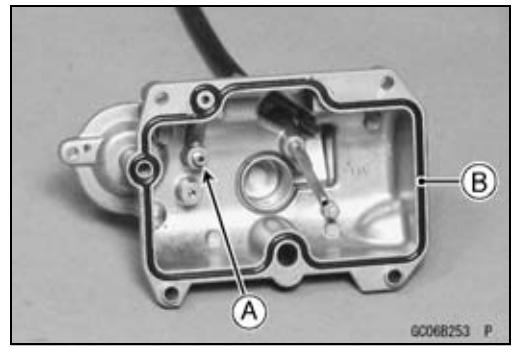


Carburetor

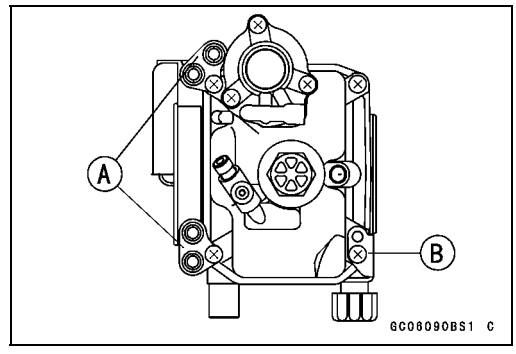
- Hanging the float valve [A] on the tang [B] of the float [C].
- Fit the float valve into the valve seat.
- Insert the pin [D].



- Install:
  Leak Jet [A]
- Replace the O-ring with new one.
- Fit the O-ring [B] onto the groove of the float bowl.



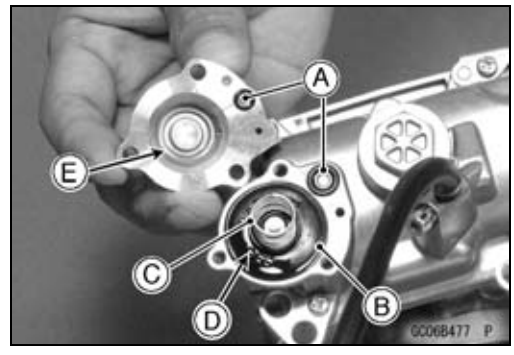
- Install:
  Float Bowl
- Tighten the bolts with hose clamps [A] and cable holder [B] as shown.



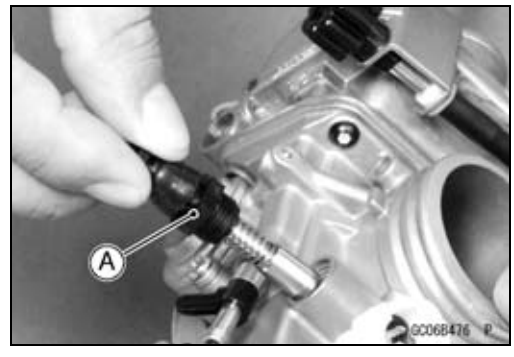
- Replace the O-rings with new ones.
- Fit the O-rings [A].
- Install:
  Diaphragm [B]
  Spring [C]
  Acceleration Pump Cover

○Install the diaphragm so that its mark facing [D] outward.
○Fit the spring end into the circle groove [E] in the cover.

- Tighten the screws.

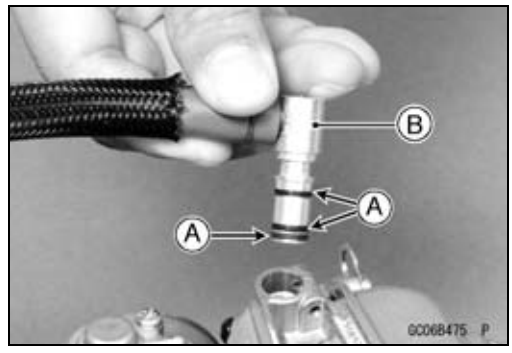


- Install the choke knob/starter plunger [A].

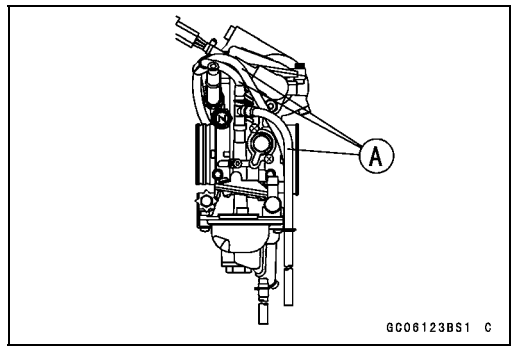


Carburetor

- Replace the O-rings [A] with the new ones.
- Install the fuel hose fitting [B].
- Tighten the screws.



- Install all tubes [A].
- Install the carburetor (see Carburetor Installation).



★If turn the adjusting screw of the acceleration pump, follow the procedure below.

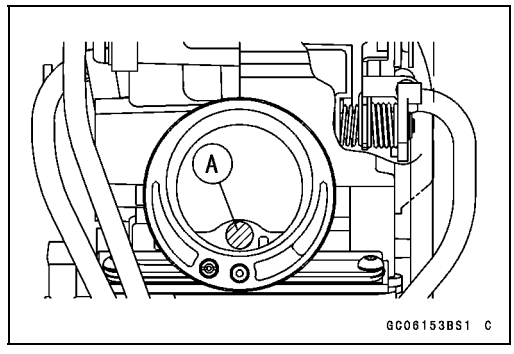
○Prepare an arbor [A] with the outside diameter of ϕ3.25.

○Open the throttle valve and insert the arbor at the bottom of the bore of the air cleaner side, and slowly close the throttle valve.

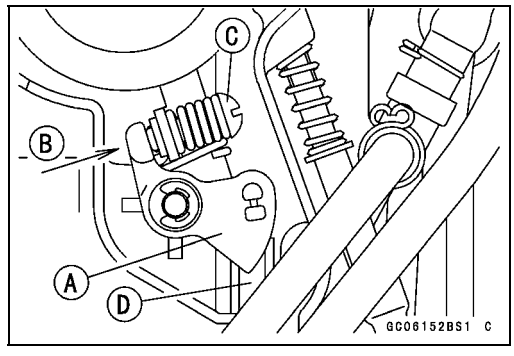
throttle Valve Height

Air Cleaner Side: 3.25 mm (0.128 in.)

(Reference)Engine Side: 1.25 mm (0.049 in.)

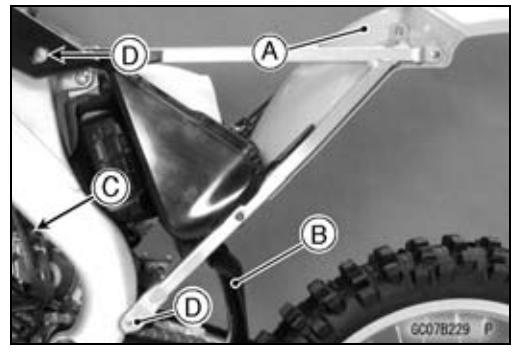


○Push the link lever [A] in the direction of the arrow [B] and adjust the timing with the adjusting screw [C] so it becomes no free play and the condition of no pushing down of the push rod [D]. (Tightening the adjusting screw makes more free play and loosening makes less free play.)

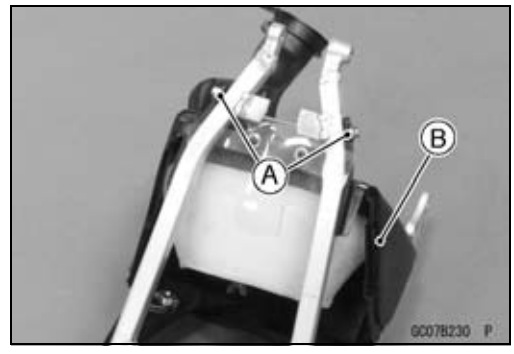


Air Cleaner

Air Cleaner Housing Removal



- Remove:
  Side Covers (see Side Cover Removal in the Frame chapter)
  Seat (see Seat Removal in the Frame chapter)
  Muffler body (see Engine Top End chapter)
  Bolts and Rear Fender [A]
  Screws and Rear Flap [B]
- Loosen the air cleaner duct clamp screw [C].
- Unscrew the rear frame bolts [D]. (see Rear Frame Removal in the Frame chapter)
- Remove the rear frame.



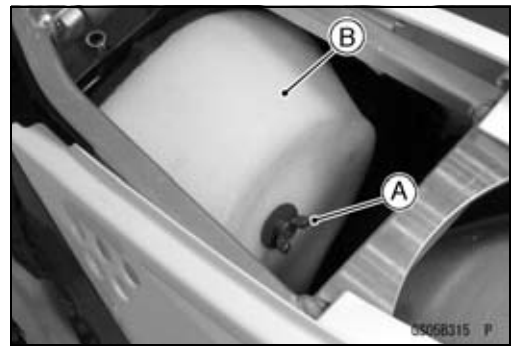
- Unscrew the air cleaner housing bolts [A].
- Remove the air cleaner housing [B].

Air Cleaner Housing Installation

- Installation is the reverse of the removal.
- Tighten the air cleaner housing and rear frame mounting bolts. (see Rear Frame Installation in the Frame chapter)

Torque - Air Cleaner Housing Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)
Rear Frame Mounting Bolts: 34 N·m (3.5 kgf·m, 25 ft·lb)

Element Removal



- Remove the seat.
- Remove the wing bolt [A] and pull out the element [B].
- Wipe out the inside of the air cleaner housing with a clean damp towel.
- Stuff a clean, lint-free towel onto the inlet tract so no dirt is allowed to enter the carburetor.

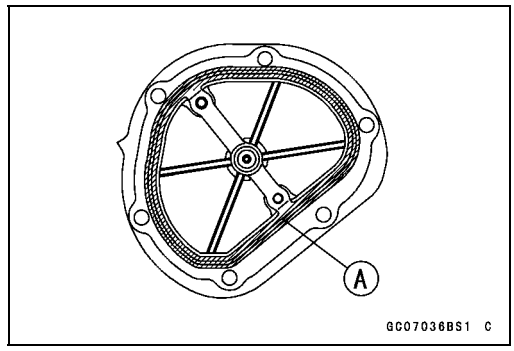
CAUTION

Check inside of the inlet tract and carburetor for dirt. If dirt is present, clean the inlet tract and carburetor thoroughly. You may also need to replace the element and seal the housing and inlet tract.

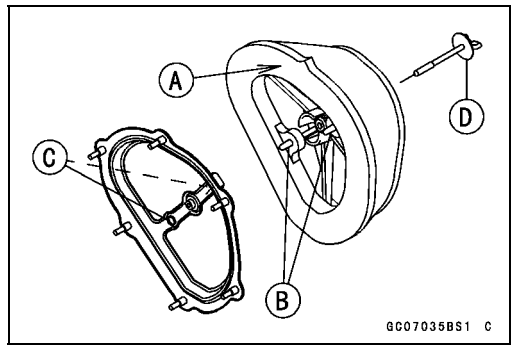
Air Cleaner

Element Installation

- When installing the element, coat the lip of the element with a thick layer of all purpose grease [A] to assure a complete seal against the air cleaner element base. Also, coat the base where the lip of the element fits.
- Apply grease to all connections and screw holes in the air cleaner housing and intake tract.
- Take out the towel from the carburetor securely.



- Install the element so that its tab [A] faces upward and fit the frame projections [B] into the holes [C] of the holder.
- Tighten the wing bolt [D].
- Install the seat (see Seat Installation in the Frame chapter).



Element Cleaning and Inspection

- Refer to the Air Cleaner Element Cleaning and Inspection in the Periodic Maintenance chapter.

Fuel Tank

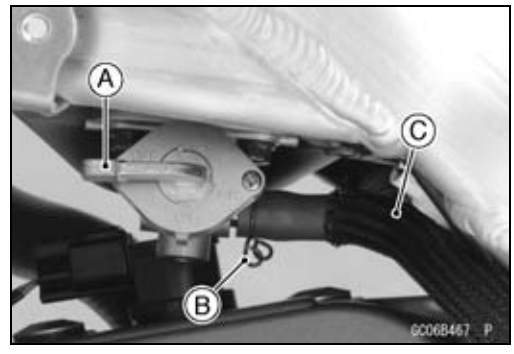
Fuel Tank Removal

⚠ WARNING

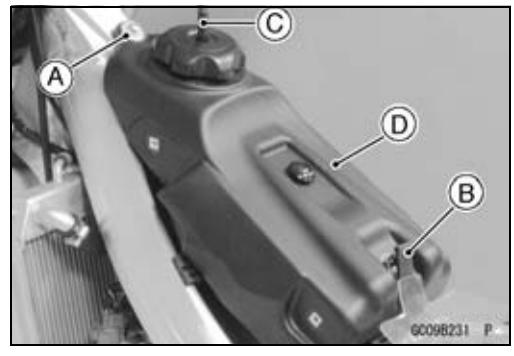
Gasoline is extremely flammable and can be explosive under certain conditions. Always stop the engine and do not smoke. Make sure the area is well-ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.

● Remove:
Seat (see Seat Removal in the Frame chapter)
Bolts [A]
Radiator Shrouds [B]

● Turn the fuel tap lever [A] to the OFF position.
● Slide out the clamp [B] and pull the fuel hose [C] off the fuel tap.
○When removing the fuel hose, do not use the pliers for preventing the hose damage and be fully careful not to give the excessive forces to the hose on working.

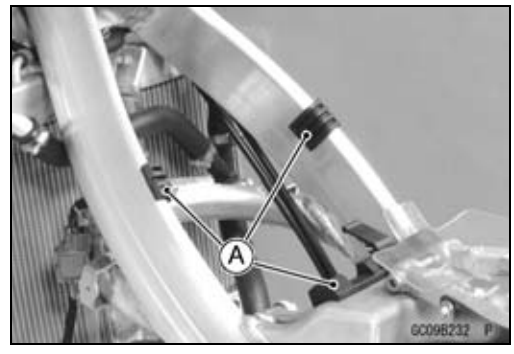


● Remove the fuel tank mounting bolt [A] and band [B].
● Pull out the fuel tank breather hose [C].
● Remove the fuel tank [D].
● Drain the fuel.



Fuel Tank Installation

● Check the rubber dampers [A] on the frame.
★If the dampers are damaged or deteriorated, replace them.

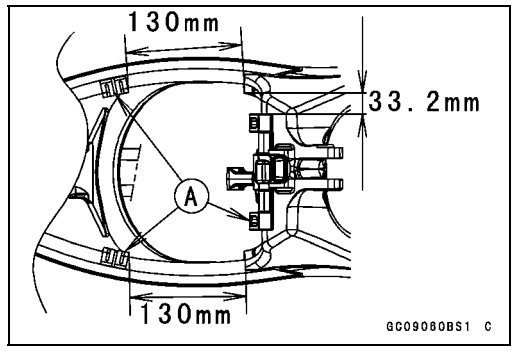


Fuel Tank

- Install the rubber dampers [A] position as shown in the figure.

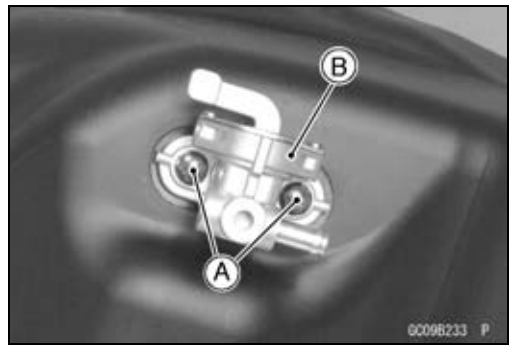
○Apply adhesive cement to the contact portion of the damper.

- Be sure the fuel hose is clamped to the fuel tap to prevent leaks.
- Insert the fuel tank breather hose outlet end into the steering stem hole.



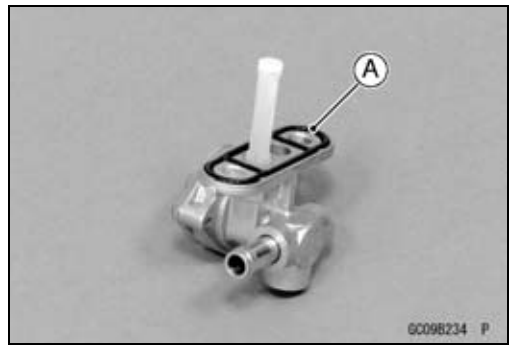
Fuel Tap Removal

- Remove the fuel tank and drain it.
- Remove the mounting bolts [A] and take out the fuel tap [B].



Fuel Tap Installation

- Replace the gasket with new one.
- Be sure the gasket [A] is in good condition to prevent leaks.
- Be sure to clamp the fuel hose to the tap to prevent leaks.



Fuel Tank and Tap Cleaning

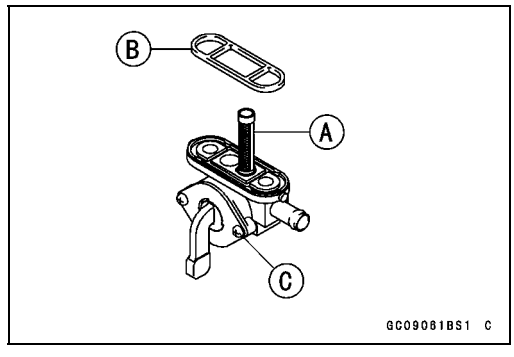
- Refer to the Fuel Inspection in the Periodic Maintenance chapter.

Fuel Tap Inspection

- Remove the fuel tap.
- Check the fuel tap filter screen [A] for any breaks or deterioration.

★If the fuel tap screen have any breaks or is deteriorated, it may allow dirt to reach the carburetor, causing poor running. Replace the fuel tap.

★If the fuel tap leaks, or allows fuel to flow when it is at OFF position, replace the damaged gasket [B] or fuel tap [C].



Cooling System

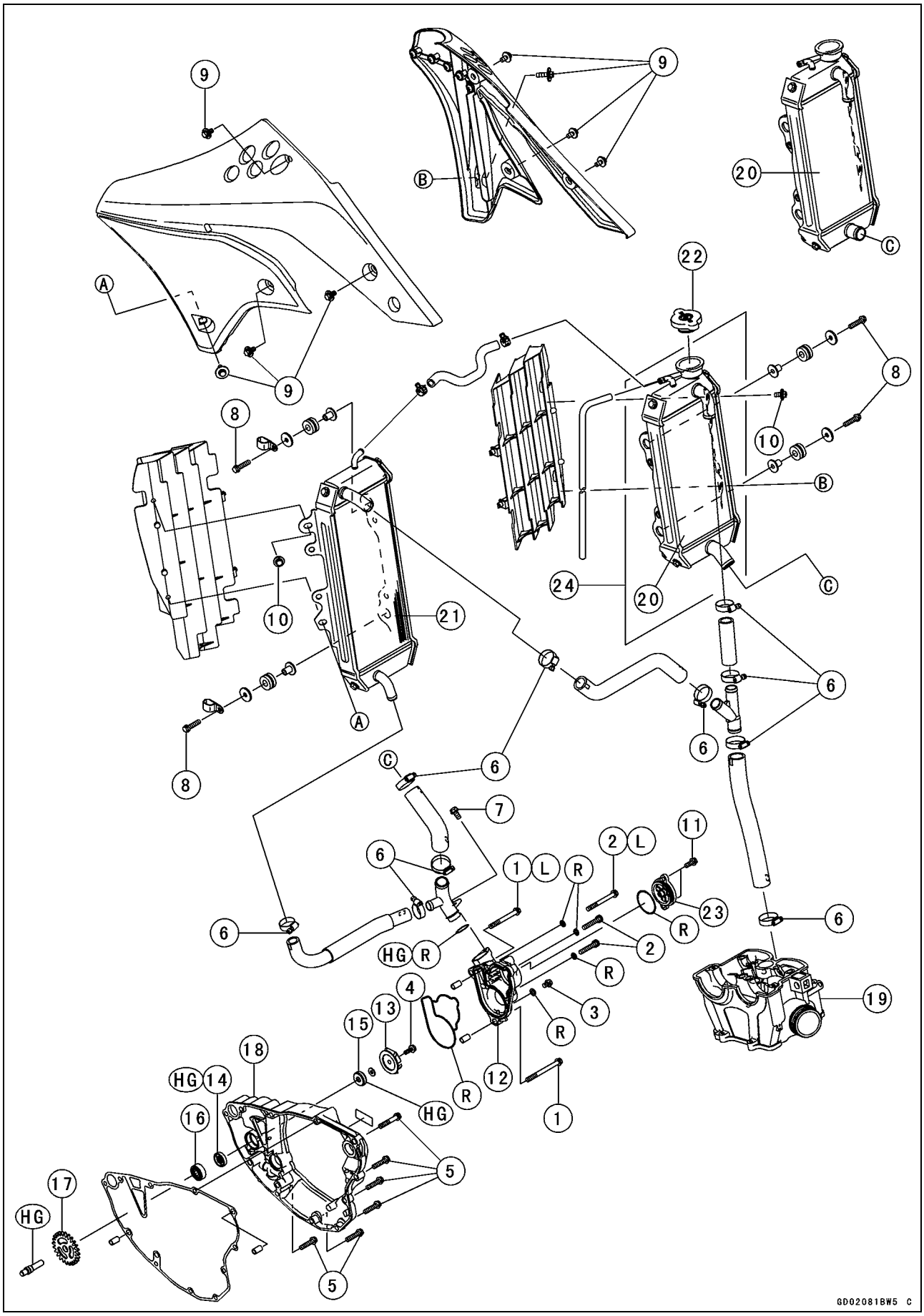
Table of Contents

Exploded View 4-2
Specifications 4-4
Special Tool 4-5
Coolant 4-6
- Coolant Level Inspection 4-6
- Coolant Deterioration Inspection 4-6
- Coolant Draining 4-6
- Coolant Filling 4-7
- Air Bleeding 4-8
- Cooling System Pressure Testing 4-8
- Cooling System Flushing 4-9

Water Pump 4-10
- Water Pump Cover Removal 4-10
- Water Pump Cover Installation 4-10
- Impeller Removal 4-11
- Impeller Installation 4-11
- Water Pump Inspection 4-11
- Water Pump Gear Removal 4-12
- Water Pump Gear Installation 4-12
- Oil Seal and Bearing Removal 4-12
- Oil Seal and Bearing Installation 4-13

Radiator 4-14
- Radiator Removal 4-14
- Radiator Installation 4-15
- Radiator Inspection 4-15
- Radiator Cap Inspection 4-16
- Filler Neck Inspection 4-16
- Water Hoses, Breather Hose Inspection 4-16
- Water Hoses, Breather Hose Installation 4-16

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Water Pump Cover Bolts	9.8	1.0	87 in·lb	L (1)
2	Water Pump Cover Bolts (with washer)	9.8	1.0	87 in·lb	L (1)
3	Coolant Drain Plug	7.0	0.7	61 in·lb	
4	Water Pump Impeller Bolt	7.0	0.7	61 in·lb	
5	Right Engine Cover Bolts	9.8	1.0	87 in·lb	
6	Water Hose Clamp Screws	1.5	0.15	13 in·lb	
7	Water Pipe Bolt	9.8	1.0	87 in·lb	
8	Radiator Mounting Bolts	9.8	1.0	87 in·lb	
9	Radiator Shroud Bolts	9.8	1.0	87 in·lb	
10	Radiator Screen Bolts	9.8	1.0	87 in·lb	
11	Oil Filter Cap Bolts	9.8	1.0	87 in·lb	

12. Water Pump Cover
13. Impeller
14. Oil Seal (Long)
15. Oil Seal (Short)
16. Bearing
17. Water Pump Gear
18. Right Engine Cover
19. Cylinder Head
20. Right Radiator
21. Left Radiator
22. Radiator Cap
23. Oil Filter Cap
24. KX250T6F

HG: Apply high-temperature grease.
R: Replacement Parts

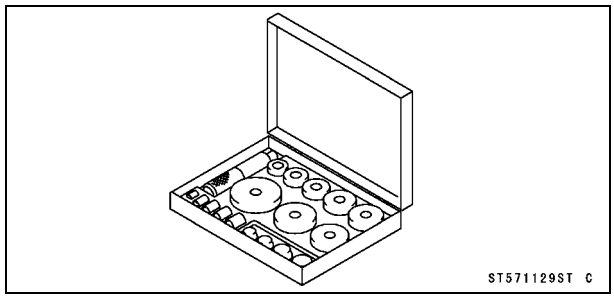
4-4 COOLING SYSTEM

Specifications

Item	Service Limit
Coolant	
Type	Permanent type antifreeze for aluminum engines and radiators
Color	Green
Mixed Ratio	Soft water 50%, antifreeze 50%
Freezing Point	–35°C (–31°F)
Total Amount	1.10 L (1.16 US qt.)
Radiator	
Cap Relief Pressure	93 ~ 123 kPa (0.95 ~ 1.25 kgf/cm², 13 ~ 18 psi)

Special Tool

Bearing Driver Set:
57001-1129



Coolant

Check the coolant level each day before riding the motorcycle, and replenish coolant if the level is low. Change the coolant in accordance with the Periodic Maintenance Chart (see Coolant Level Inspection in the Periodic Maintenance chapter).

⚠ WARNING

To avoid burns, do not remove the radiator cap or try to inspect the coolant level or change the coolant when the engine is still hot. Wait until it cools down.

Coolant Level Inspection

- Refer to the Coolant Level Inspection in the Periodic Maintenance chapter.

Coolant Deterioration Inspection

- Refer to the Coolant Deterioration Inspection in the Periodic Maintenance chapter.

Coolant Draining

- The coolant should be changed periodically to ensure long engine life.

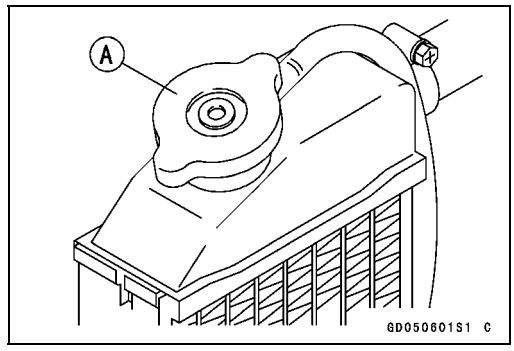
⚠ WARNING

To avoid burns, do not remove the radiator cap or try to change the coolant when the engine is still hot. Wait until it cools down.
Coolant on tires will make them slippery and can cause an accident and injury. Immediately wipe up or wash away any coolant that spills on the frame, engine or other painted parts. Since coolant is harmful to the human body, do not use for drinking.

- Remove the radiator cap [A].

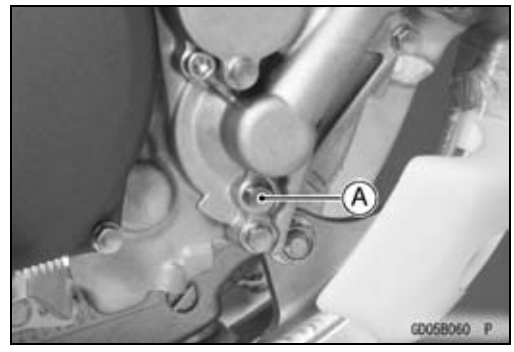
NOTE

○*Remove the radiator cap in two steps. First turn the cap counterclockwise to the first stop and wait there for a few seconds. Then push down and turn it further in the same direction and remove the cap.*



Coolant

- Place a container under the coolant drain plug [A], and drain the coolant from the radiator and engine by removing the drain plug on the water pump cover. Immediately wipe or wash out any coolant that spills on the frame, or engine.
- Inspect the old coolant for visual evidence of corrosion and abnormal smell (see Coolant Deterioration Inspection in the Periodic Maintenance chapter).



Coolant Filling

CAUTION

Use coolant containing corrosion inhibitors made specifically for aluminum engines and radiators in accordance with the instruction of the manufacture's. Soft or distilled water must be used with the antifreeze (see below for antifreeze) in the cooling system. If hard water is used in the system, it causes scale accumulation in the water passages, and considerably reduces the efficiency of the cooling system.

Recommended Coolant

Type:	**Permanent type antifreeze (soft water and ethylene glycol plus corrosion and rust inhibitor chemicals for aluminum engines and radiators)**
Color:	**Green**
Mixed ratio:	**Soft water 50%, Coolant 50%**
Freezing point:	**−35°C (−31°F)**
Total amount	**1.10 L (1.16 US qt.)**

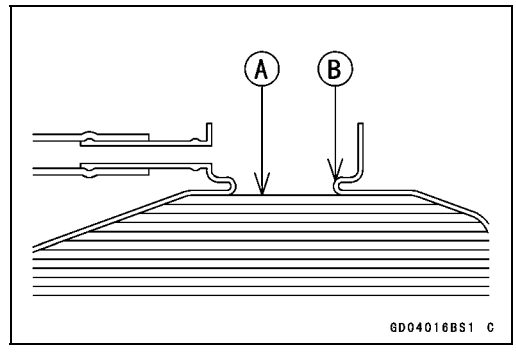
- Install the drain plug.

○Replace the gasket with a new one.

Torque - Coolant Drain Plug: 7.0 N·m (0.7 kgf·m, 61 in·lb)

- Fill the radiator up to the bottom of the radiator filler neck [B] with coolant [A], and install the cap, turning it clockwise about 1/4 turn.

○Lean the motorcycle slightly until the radiator filler neck is level to the ground so that the filler neck is located uppermost in order to exhaust the air accumulated in the radiator.



NOTE

○*Pour in the coolant slowly so that it can expel the air from the engine and radiator. The radiator cap must be installed in two steps. First turn the cap clockwise to the first stop. Then push down on it and turn it the rest of the way.*

- Check the cooling system for leaks.

Coolant

Air Bleeding

Before putting the motorcycle into operation, any air trapped in the cooling system must be removed as follows.

- Start the engine, warm up the engine thoroughly, and then stop the engine. Wait until the engine cools down.
- Remove the radiator cap.
- Check the coolant level (see Coolant Level Inspection in the Periodic Maintenance chapter).

★If the coolant level is low, add coolant up to the bottom of the filler neck.

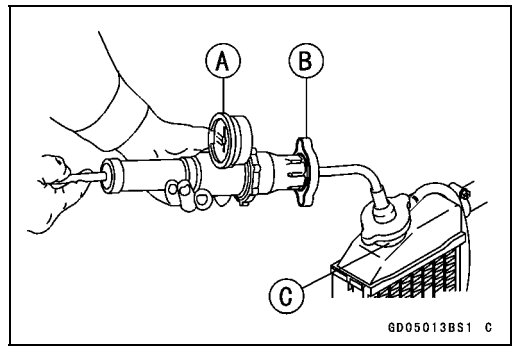
- Install the radiator cap.
- Check the cooling system for leaks.

Cooling System Pressure Testing

CAUTION

During pressure testing, do not exceed the pressure for which the system is designed to work. The maximum pressure is 123 kPa (1.25 kgf/cm², 18 psi).

- Remove the radiator cap, and install a cooling system pressure tester [A] and adapter [B] on the radiator filler neck [C].



NOTE

○*Wet the adapter cap sealing surfaces with water or coolant to prevent pressure leaks.*

- Build up pressure in the system carefully until the pressure reaches 123 kPa (1.25 kgf/cm², 18 psi).
- Watch the gauge for at least 6 seconds. If the pressure holds steady, the cooling system is all right.
- Remove the pressure tester, replenish the coolant, and install the radiator cap.

★If the pressure drops and no external source is found, check for internal leaks. Check the cylinder head gasket for leaks.

Coolant

Cooling System Flushing

Over a period of time, the cooling system accumulates rust, scale, and lime in the water jacket and radiator. When this accumulation is suspected or observed, flush the cooling system. If this accumulation is not removed, it will clog up the water passages and considerably reduce the efficiency of the cooling system.

- Drain the cooling system.
- Fill the cooling system with fresh water mixed with a flushing compound.

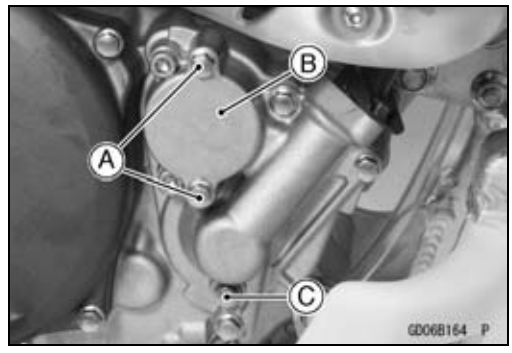
CAUTION
Avoid the use of a flushing compound which is harmful to the aluminum engine and radiator. Carefully follow the instructions supplied by the manufacture of the cleaning product.

- Warm up the engine, and run it at normal operating temperature for about ten minutes.
- Stop the engine, and drain the cooling system after the coolant cools down.
- Fill the system with fresh water.
- Warm up the engine and drain the system after the coolant cools down.
- Repeat the previous two steps once more.
- Fill the system with a permanent type coolant, and bleed the air from the system (see Air Bleeding).

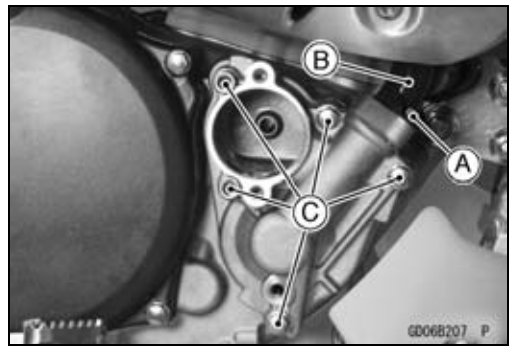
Water Pump

Water Pump Cover Removal

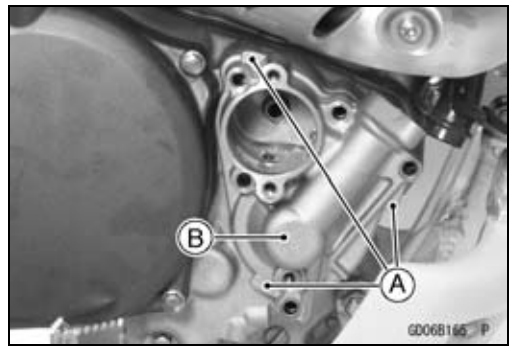
● Drain the engine oil from the water pump cover.
○Unscrew the bolts [A] and remove the oil filter cap [B].
● Drain the coolant (see Coolant Draining).
○Unscrew the drain bolt [C].
● Remove:
Spring (see Oil Filter Change in the Periodic Maintenance chapter)
Oil Filter (see Oil Filter Change in the Periodic Maintenance chapter)



● Unscrew the water pipe bolt [A], and disconnect the water pipe [B].
● Unscrew the water pump cover bolts [C].

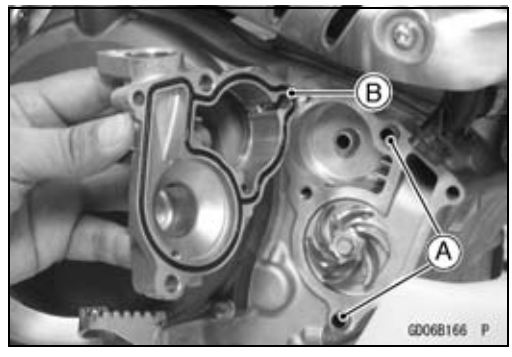


● Using the pry points [A], remove the pump cover [B].



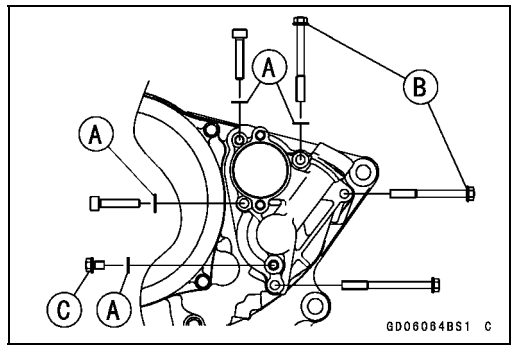
Water Pump Cover Installation

● Install:
Dowel Pins [A]
● Replace the pump cover gasket with a new one.
● Apply grease to the pump cover gasket [B].



● Install the water pump cover.
○Replace the bolt washers [A] with a new ones.
○Apply a non-permanent locking agent to the two bolts [B].
● Tighten:

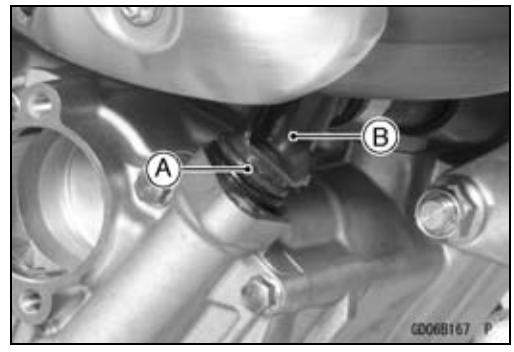
Torque - Water Pump Cover Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)
Coolant Drain Bolt [C]: 7.0 N·m (0.7 kgf·m, 61 in·lb)



Water Pump

- Apply grease to the water pipe O-ring [A].
- Insert the water pipe [B] straightly into the hole of the water pump cover.
- Tighten:

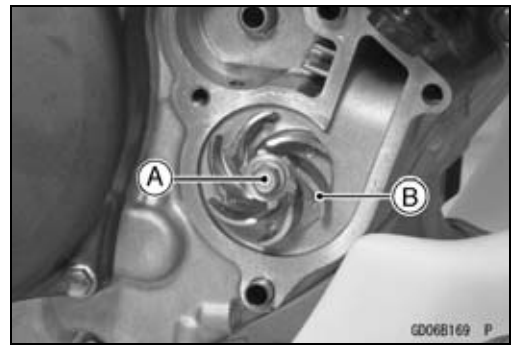
Torque - Water Pipe Bolt: 9.8 N·m (1.0 kgf·m, 87 in·lb)



- Install the oil filter (see Oil Filter Change in the Periodic Maintenance chapter).
- Fill the cooling system (see Coolant Filling).
- Bleed the air from the cooling system.
- Check the engine oil level and add the engine oil.

Impeller Removal

- Remove:
  Water Pump Cover (see Water Pump Cover Removal)
- Remove the impeller bolt [A] and take out the impeller [B] with washer.

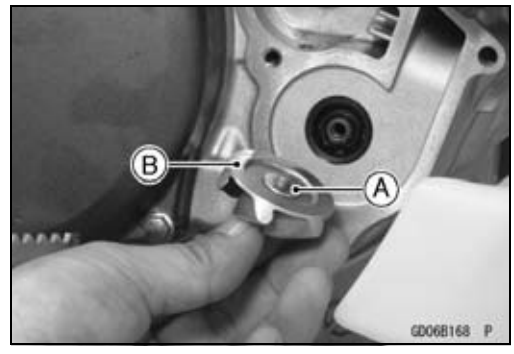


Impeller Installation

- Install the washer [A] and impeller [B].
- Tighten the impeller bolt.

Torque - Water Pump Impeller Bolt: 7.0 N·m (0.7 kgf·m, 61 in·lb)

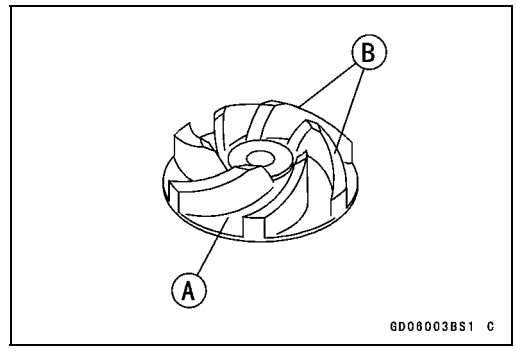
- Install the water pump cover.



Water Pump Inspection

- Visually check the impeller [A].

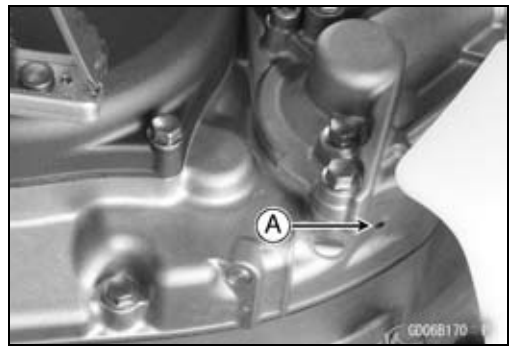
★If the surface is corroded, or if the blades [B] are damaged, replace the impeller.



Water Pump

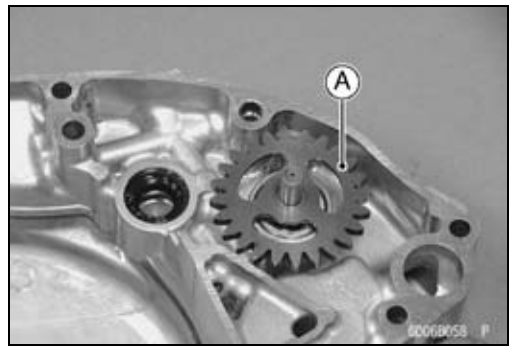
- Check the drainage outlet passage [A] at the bottom of the right engine cover for coolant leaks.

★If the oil seal is damaged, the coolant leaks through the seal and drains through the passage. Replace the oil seals.



Water Pump Gear Removal

- Remove:
  Water Pump Cover (see Water Pump Cover Removal)
  Impeller (see Impeller Removal)
  Right Engine Cover (see Right Engine Cover Removal in the Engine Right Side chapter)
- Pull out the water pump gear [A] with shaft toward inside of the right engine cover.



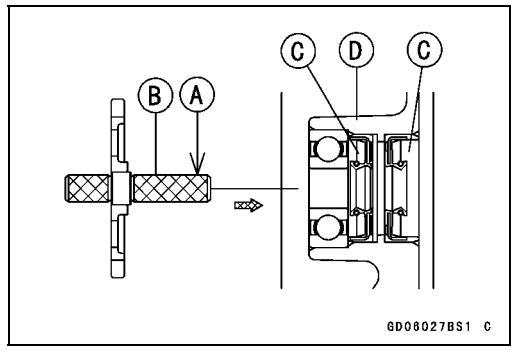
Water Pump Gear Installation

- To prevent the oil seal lips from peeling, apply thin coat of grease [A] to the water pump gear shaft [B] and insert it into the oil seals [C] from the inside of the right engine cover [D].

CAUTION

Be sure to apply grease to the water pump shaft when installing. If it is installed dry, the seals may wear excessively.

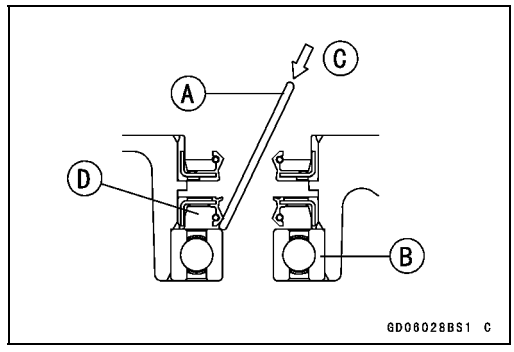
- Instal the impeller and check to see that the impeller turn freely.



Oil Seal and Bearing Removal

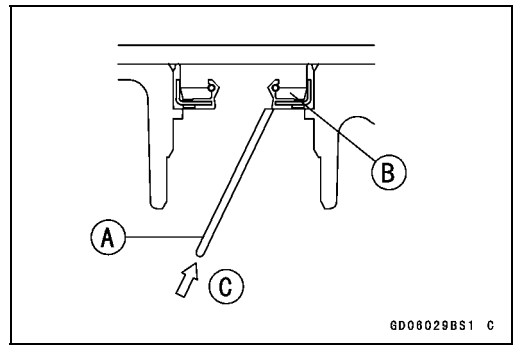
- Remove:
  Right Engine Cover (see Right Engine Cover Removal in the Engine Right Side chapter)
  Water Pump Gear
- Insert a bar [A] into the water pump shaft hole from the outside of the right engine cover, and remove the ball bearing [B] by tapping [C] evenly around the bearing inner race.

○Remove the oil seal [D] from the right engine cover in the same way as ball bearing removal.



Water Pump

- Insert a bar [A] into the water pump shaft hole from the inside of the right engine cover, and remove the oil seal [B] by tapping [C] evenly around the seal lips.



Oil Seal and Bearing Installation

CAUTION

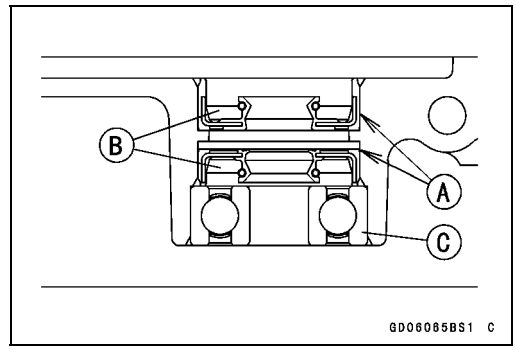
If the oil seal or ball bearing is removed, replace all of them with new ones at the same time

- Be sure to replace the oil seals.
- Apply plenty of high temperature grease to the oil seal lips.
- Press in the oil seals direction as shown.

○Press in the new oil seal using a press and suitable tools so that the seal surface is flush with the surface of the right engine cover.
  Flat Side [A]
  Water Pump Oil Seals [B]

- Press the ball bearing [C] into the hole until the face of the bearing is even with the end of the hole.

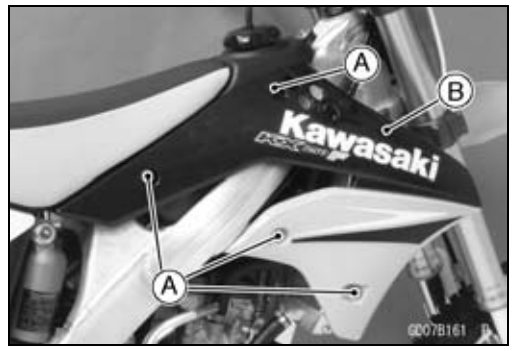
Special Tool - Bearing Driver Set: 57001-1129



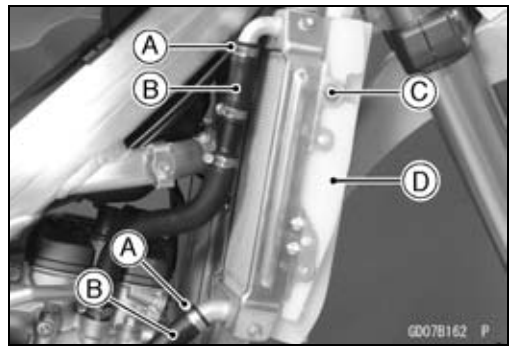
Radiator

Radiator Removal

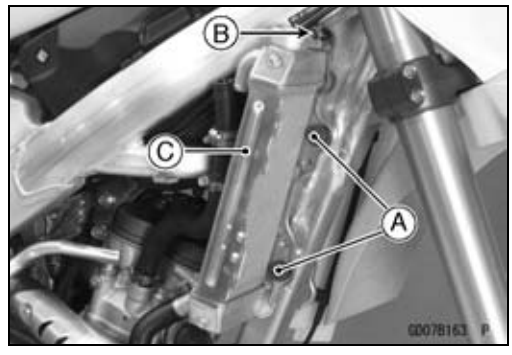
- Drain the coolant (see Coolant Draining).
- Remove:
  Bolts [A]
  Radiator Shrouds [B]



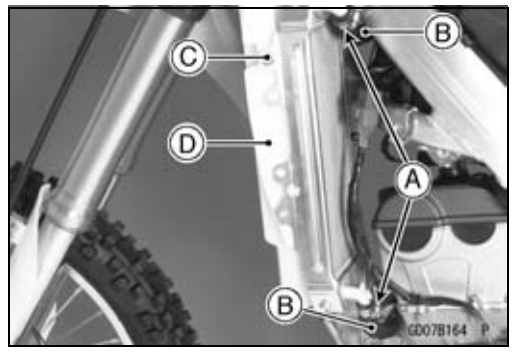
- Loosen:
  Clamp Screws [A]
- Remove:
  Water Hoses [B]
  Bolt [C]
  Right Radiator Screen [D]



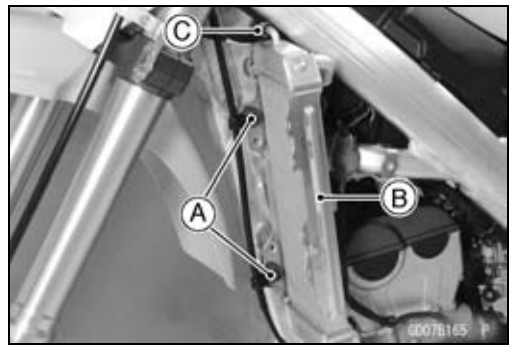
- Unscrew the bolts [A].
- Loosen:
  Clamp [B] (Slide out)
- Remove:
  Right Radiator [C] with Breather Tube



- Loosen:
  Clamp Screw [A]
- Remove:
  Water Hoses [B]
  Bolts [C]
  Left Radiator Screen [D]



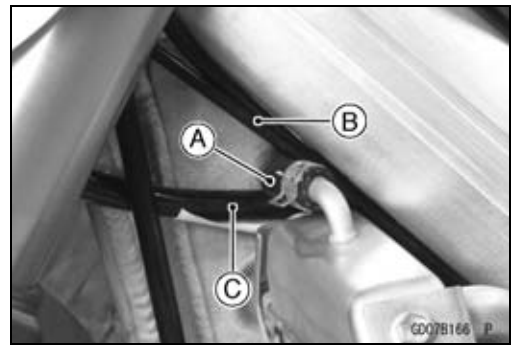
- Remove:
  Bolts with Clamps [A]
  Left Radiator [B] with Hose [C]



Radiator

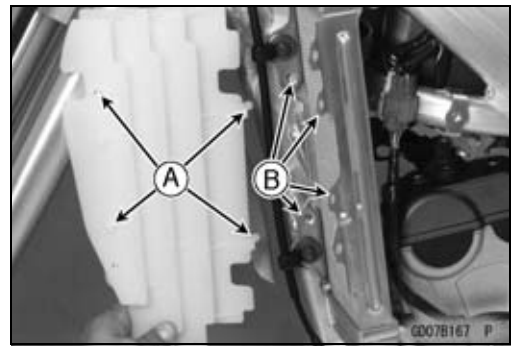
Radiator Installation

- Run the water hose [A] between the hot starter cable, engine stop switch lead [B] and main harness [C].



- Hold the clutch cable with clamps.
- Fit the projections [A] of the screen in the holes [B] of the radiator.

Torque - Water Hose Clamp Screws: 1.5 N·m (0.15 kgf·m, 13 in·lb)
Radiator Mounting Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)
Radiator Screen Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)
Radiator Shroud Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)



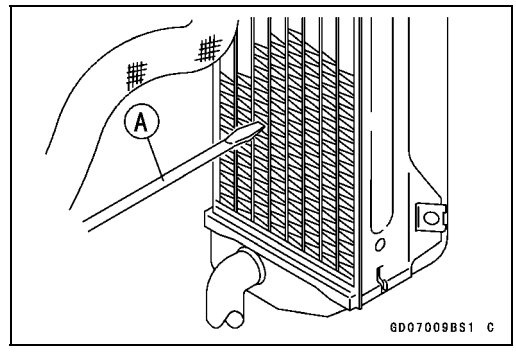
- Route the water hoses and breather tube correctly (see Cable, Wire, and Hose Routing Section in the Appendix chapter).
- Fill the cooling system with a permanent type coolant.

Radiator Inspection

- Check the radiator core.

★If there are obstructions to air flow, remove them.

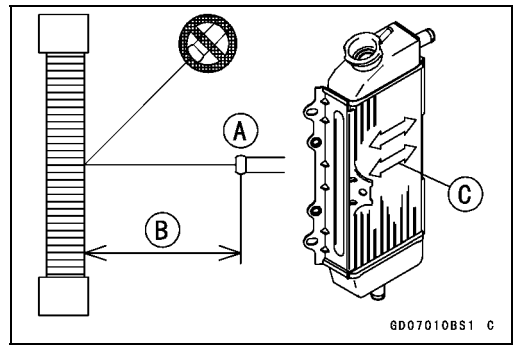
★If the corrugated fins are deformed, carefully straighten them with the thin blade of a screwdriver [A].



CAUTION

Do not tear the radiator tubes while straightening the fins.

★If the air passages of the radiator core are blocked more than 20% by unremovable obstructions or irreparably deformed fins, replace the radiator with a new one.



CAUTION

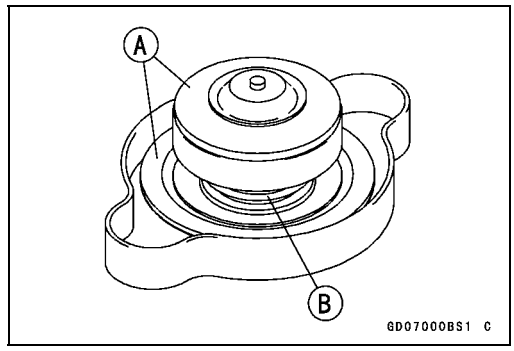
When cleaning the radiator with steam cleaner, be careful of the following to prevent radiator damage. Keep the steam gun [A] away more than 0.5 m (1.64 ft) [B] from the radiator core. Hold the steam gun perpendicular to the core surface. Run the steam gun following the core fin direction [C].

Radiator

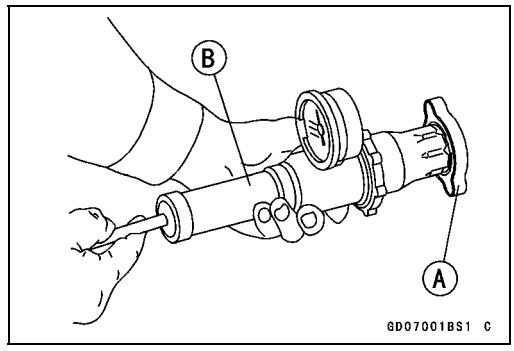
Radiator Cap Inspection

- Check the condition of the valve spring [B], and the top and bottom valve seals [A] of the radiator cap.

★If any one of them shows visible damage, replace the cap.



- Wet the top and bottom valve seals with water or coolant to prevent pressure leaks.
- Install the cap [A] on a cooling system pressure tester [B].
- Watching the pressure gauge, slowly pump the pressure tester to build up the pressure. The gauge hand must remain within the relief pressure range in the table below at least 6 seconds. Continue to pump the tester until the relief valve opens, indicated by the gauge hand flicking downward. The relief valve must open within the specified range.



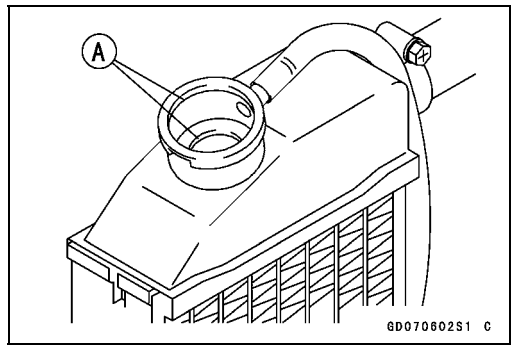
Radiator Cap Relief Pressure

Standard: 93 ~ 123 kPa (0.95 ~ 1.25 kgf/cm², 13 ~ 18 psi)

★If the cap cannot hold the pressure, or if the relief pressure is too high or too low, replace the cap with a new one.

Filler Neck Inspection

- Check the radiator filler neck for signs of damage.
- Check the condition of the top and bottom sealing seats [A] in the filler neck. They must be smooth and clean for the radiator cap to function properly.



Water Hoses, Breather Hose Inspection

- Refer to the Water Hoses and Connections Inspection in the Periodic Maintenance chapter.

Water Hoses, Breather Hose Installation

- Install the water hoses or breather hose being careful to follow the performed bends (see Appendix chapter). Avoid sharp bending, kinking, flattening, or twisting.
- Tighten the hose clamps securely.

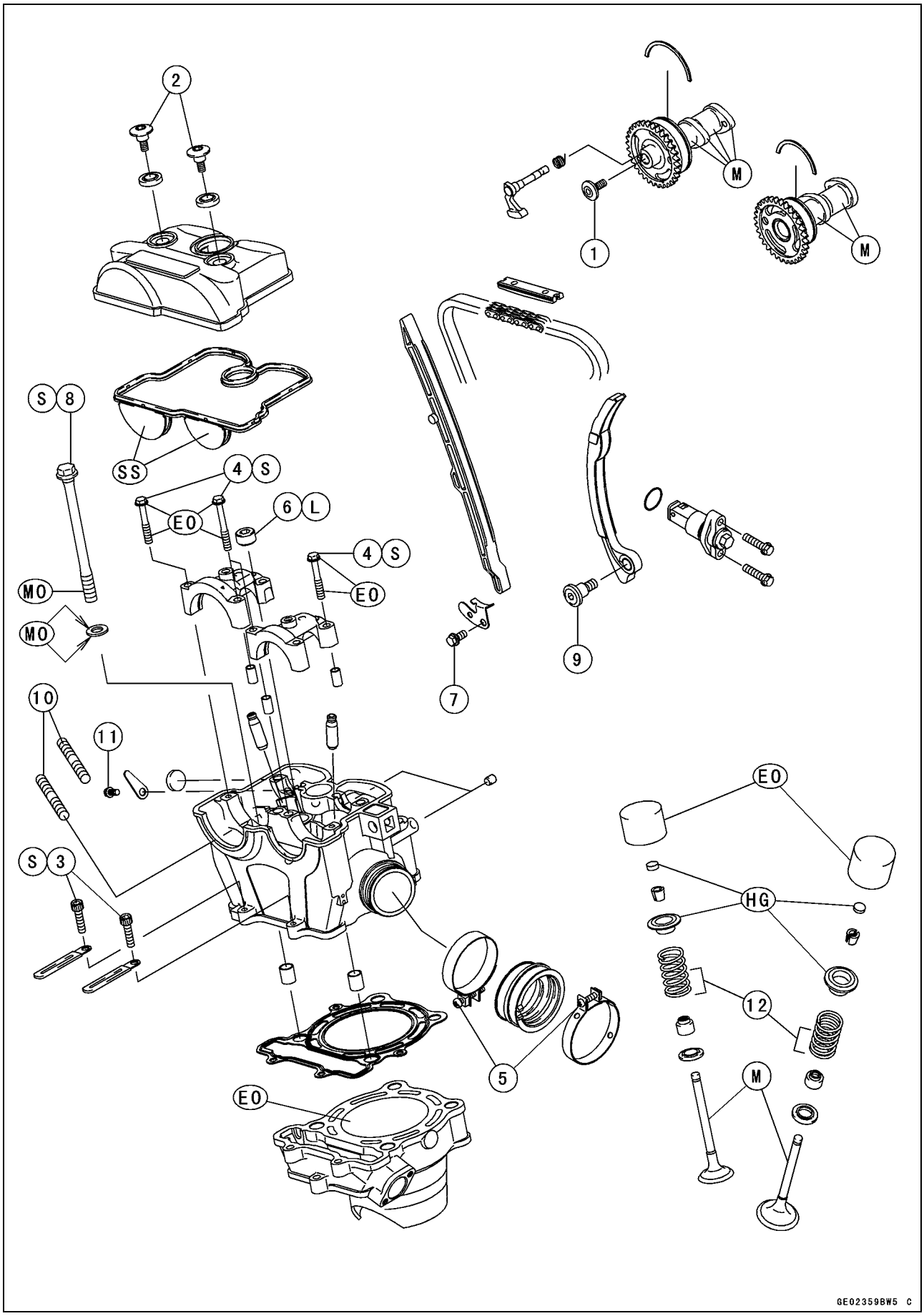
Torque - Water Hose Clamp Screws: 1.5 N·m (0.15 kgf·m, 13 in·lb)

Engine Top End

Table of Contents

Exploded View 5-2
Specifications 5-6
Special Tools & Sealant 5-10
Cylinder Head Cover 5-13
  Cylinder Head Cover Removal 5-13
  Cylinder Head Cover Installation . 5-13
Camshaft Chain Tensioner 5-14
  Camshaft Chain Tensioner Removal 5-14
  Camshaft Chain Tensioner Installation 5-14
Camshaft 5-15
  Camshaft Removal 5-15
  Camshaft Installation 5-16
  Camshaft Chain Removal 5-18
  Camshaft Chain Installation 5-18
  Camshaft and Camshaft Cap Wear Inspection 5-19
  Camshaft Runout Inspection 5-19
  Cam Wear Inspection 5-19
Cylinder Head 5-20
  Cylinder Compression Measurement 5-20
  Cylinder Head Removal 5-21
  Cylinder Head Installation 5-22
  Cylinder Head Cleaning 5-24
  Cylinder Head Warp Inspection ... 5-24
Valves 5-25
  Valve Clearance Inspection 5-25
  Valve Removal 5-25
  Valve Installation 5-25
  Valve Guide Removal 5-26
  Valve Guide Installation 5-26
  Valve/Valve Guide Clearance Measurement (Wobble Method) 5-27
  Valve Seat Inspection 5-28
  Valve Seat Repair 5-28
Cylinder and Piston 5-33
  Cylinder Removal 5-33
  Piston Removal 5-33
  Cylinder and Piston Installation 5-33
  Cylinder Wear Inspection 5-35
  Piston Wear Inspection 5-35
  Piston/Cylinder Clearance Inspection 5-35
  Piston Ring/Ring Groove Clearance Inspection 5-35
  Piston Ring Groove Width Inspection 5-36
  Piston Ring Thickness Inspection 5-36
  Piston Ring End Gap Measurement 5-36
  Piston, Piston Pin, Connecting Rod Wear Inspection 5-37
Carburetor Holder 5-38
  Carburetor Holder Installation 5-38
Muffler 5-39
  Muffler Removal 5-39
  Muffler Installation 5-39
  Muffler Baffle Change 5-39

Exploded View

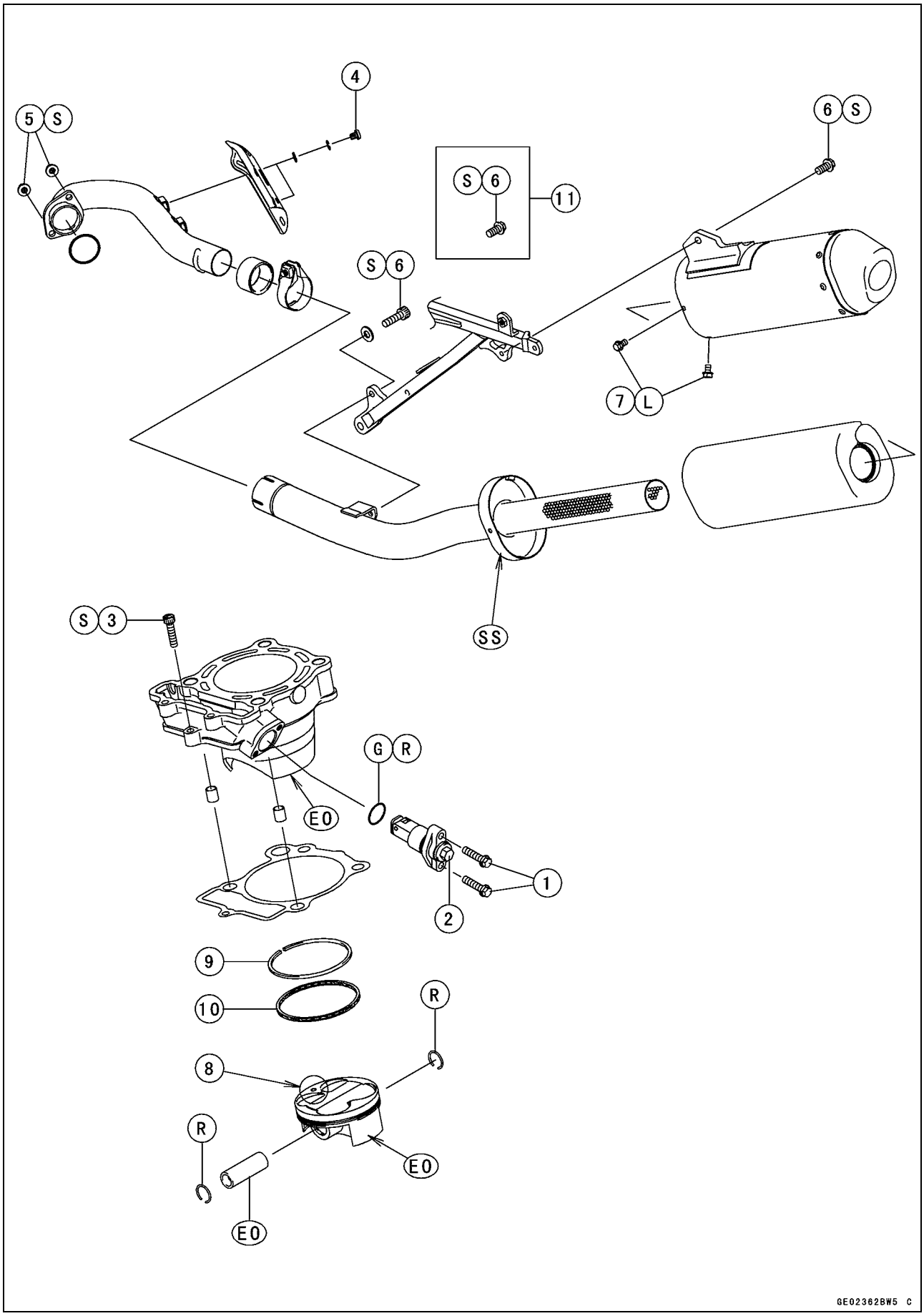


Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Auto-Decompressor Bolt	12	1.2	104 in·lb	
2	Cylinder Head Cover Bolts	9.8	1.0	87 in·lb	
3	Cylinder Head Bolts M6	12	1.2	104 in·lb	S
4	Camshaft Cap Bolts	9.8	1.0	87 in·lb	S, EO
5	Carburetor Holder Clamp Screw	2.0	0.2	17 in·lb	
6	Plug	20	2.0	14	L
7	Lower Camshaft Chain Guide Bolt	9.8	1.0	87 in·lb	
8	Cylinder Head Bolts M10	49	5.0	36	S, MO
9	Rear Camshaft Chain Guide Bolt	15	1.5	11	
10	Exhaust Pipe Stud	–	–	–	L (Planted side)
11	Decompressor Plug Plate Bolt	9.8	1.0	87 in·lb	

12. Closed coil end faces downwards.
EO: Apply engine oil.
HG: Apply high temperature grease.
L: Apply a non-permanent locking agent.
M: Apply molybdenum disulfide grease.
MO: Apply molybdenum disulfide oil.
R: Replacement Parts
S: Follow the specific tightening sequence.
SS: Apply silicon sealant.

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Camshaft Chain Tensioner Mounting Bolts	9.8	1.0	87 in·lb	
2	Camshaft Chain Tensioner Cap Bolt	20	2.0	14.5	
3	Cylinder Bolt M6	12	1.2	104 in·lb	S
4	Exhaust Pipe Cover Screws	12	1.2	104 in·lb	
5	Exhaust Pipe Holder Nuts	21	2.1	15	S
6	Muffler Mounting Bolts	21	2.1	15	S
7	Muffler Pipe Mounting Bolts	12	1.2	104 in·lb	L

8. Circle Mark
9. Top Ring
10. Oil Ring
11. KX250T6F ~ T7F

EO: Apply engine oil.
G: Apply high temperature grease.
L: Apply a non-permanent locking agent.
R: Replacement Parts
S: Follow the specific tightening sequence.
SS: Apply silicone sealant.

Specifications

Item	Standard	Service Limit
Camshafts		
Cam Height:		
Exhaust	33.941 ~ 34.057 mm (1.3363 ~ 1.3408 in.)	33.84 mm (1.3322 in.)
Inlet	34.642 ~ 34.758 mm (1.3639 ~ 1.3684 in.)	34.54 mm (1.3598 in.)
Camshaft Bearing Clearance	0.020 ~ 0.062 mm (0.0008 ~ 0.0024 in.)	0.15 mm (0.0059 in.)
Camshaft Journal Diameter	21.959 ~ 21.980 mm (0.8645 ~ 0.8654 in.)	21.93 mm (0.8634 in.)
Camshaft Journal Inside Diameter	22.000 ~ 22.021 mm (0.8661 ~ 0.8670 in.)	22.08 mm (0.8693 in.)
Camshaft Runout	TIR 0.02 mm (0.0008 in.) or less	TIR 0.1 mm (0.0039 in.)
Cylinder Head		
Cylinder Compression	(Usable range) 431 ~ 706 kPa (4.4 ~ 7.2 kgf/cm², 62.5 ~ 102 psi) @ 5 kicks	– – –
Cylinder Head Warp	– – –	0.05 mm (0.0020 in.)
Valve		
Valve Clearance:		
Exhaust	0.17 ~ 0.22 mm (0.0067 ~ 0.0087 in.)	– – –
Inlet	0.10 ~ 0.15 mm (0.0039 ~ 0.0059 in.)	– – –
Valve Stem Bend	TIR 0.01 mm (0.0004 in.) or less	TIR 0.05 mm (0.0020 in.)
Valve Stem Diameter:		
Exhaust	4.455 ~ 4.470 mm (0.1754 ~ 0.1760 in.)	4.44 mm (0.1748 in.)
Inlet	4.475 ~ 4.490 mm (0.1762 ~ 0.1768 in.)	4.46 mm (0.1756 in.)
Valve Guide Inside Diameter:		
Exhaust	4.500 ~ 4.512 mm (0.1772 ~ 0.1776 in.)	4.57 mm (0.1779 in.)
Inlet	4.500 ~ 4.512 mm (0.1772 ~ 0.1776 in.)	4.57 mm (0.1779 in.)
Valve/valve Guide Clearance (wobble method):		
Exhaust	0.08 ~ 0.16 mm (0.0031 ~ 0.0063 in.)	0.32 mm (0.0126 in.)
Inlet	0.03 ~ 0.10 mm (0.0012 ~ 0.0039 in.)	0.26 mm (0.0102 in.)
Valve Seat Cutting Angle	45°, 32°, 60°	– – –

Specifications

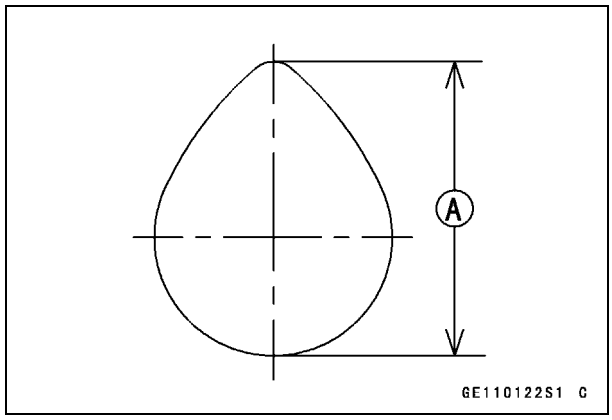
Item	Standard	Service Limit
Valve Seat Surface Outside Diameter:		
Exhaust	24.62 ~ 24.82 mm (0.9693 ~ 0.9772 in.)	– – –
Inlet	30.62 ~ 30.82 mm (1.2055 ~ 1.2134 in.)	– – –
Valve Seat Surface Width:		
Exhaust	0.5 ~ 1.0 mm (0.0197 ~ 0.0394 in.)	– – –
Inlet	0.5 ~ 1.0 mm (0.0197 ~ 0.0394 in.)	– – –
Valve Spring Free Length:		
Exhaust	37.88 mm (1.4913 in.)	36.5 mm (1.437 in.)
Inlet	37.00 mm (1.4610 in.)	35.7 mm (1.406 in.)
Cylinder and Pistons		
Cylinder Inside Diameter	77.000 ~ 77.012 mm (3.0315 ~ 3.0320 in.)	77.06 mm (3.0339 in.)
Piston Diameter	76.955 ~ 76.970 mm (3.0297 ~ 3.0303 in.)	76.82 mm (3.0244 in.)
Piston/Cylinder Clearance	0.030 ~ 0.057 mm (0.0012 ~ 0.0022 in.)	– – –
Piston Ring/Ring Groove Clearance:		
Top	0.04 ~ 0.08 mm (0.0016 ~ 0.0031 in.)	0.18 mm (0.0071 in.)
Piston Ring Groove Width:		
Top	0.83 ~ 0.85 mm (0.0327 ~ 0.0335 in.)	0.93 mm (0.0366 in.)
Piston Ring Thickness:		
Top	0.77 ~ 0.79 mm (0.0303 ~ 0.0311 in.)	0.70 mm (0.0276 in.)
Piston Ring End Gap:		
Top	0.15 ~ 0.25 mm (0.0059 ~ 0.0098 in.)	0.55 mm (0.0217 in.)
Oil	0.20 ~ 0.70 mm (0.0079 ~ 0.0276 in.)	1.0 mm (0.0394 in.)
Piston Pin Diameter	15.992 ~ 15.997 mm (KX250T6F) (0.6296 ~ 0.6298 in.) 15.991 ~ 16.000 mm (KX250T7F ~) (0.6296 ~ 0.6299 in.)	15.96 mm (0.628 in.)
Piston Pin Hole Diameter	16.004 ~ 16.010 mm (0.6301 ~ 0.6303 in.)	16.07 mm (0.633 in.)
Small End Inside Diameter	16.010 ~ 16.018 mm (0.6303 ~ 0.6306 in.)	16.05 mm (0.632 in.)

Specifications

TIR: Total Indicator Readings

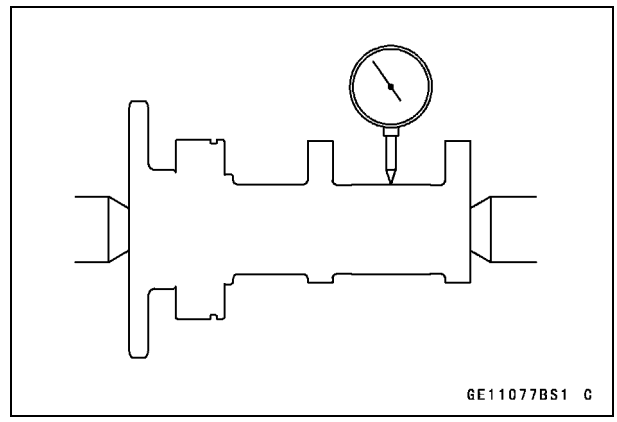
Specifications

Cam Height

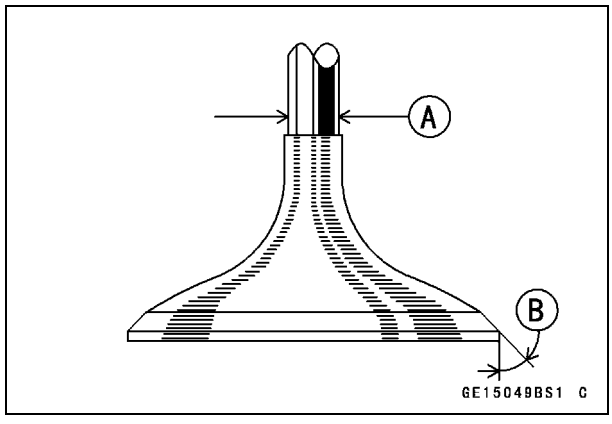


Cam Height [A]

Camshaft Runout

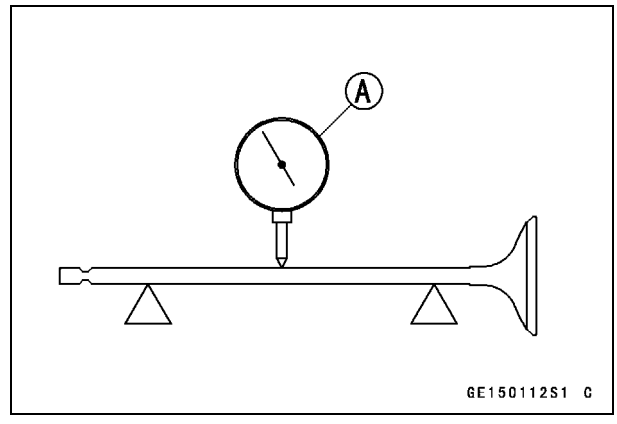


Valve Stem Diameter



Valve Stem Diameter [A]
45° [B]

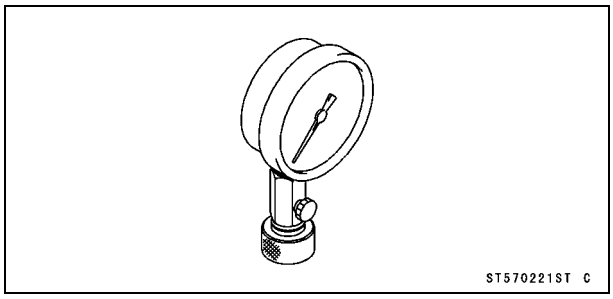
Valve Stem Bend



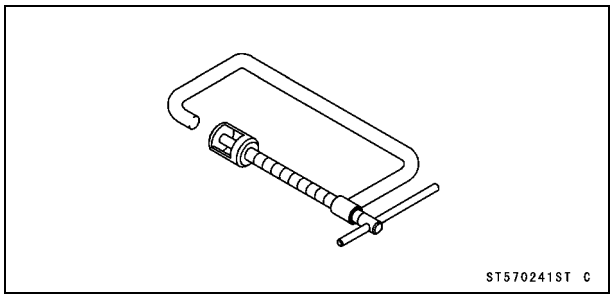
Dial Gauge [A]

Special Tools & Sealant

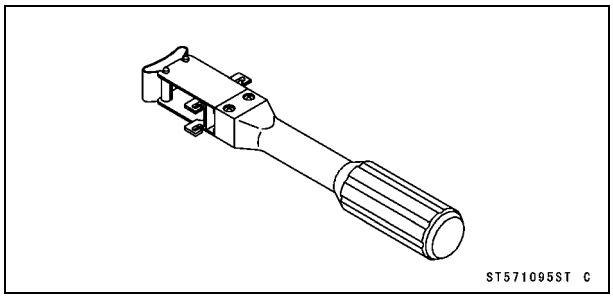
Compression Gauge, 20 kgf/cm²:
57001-221



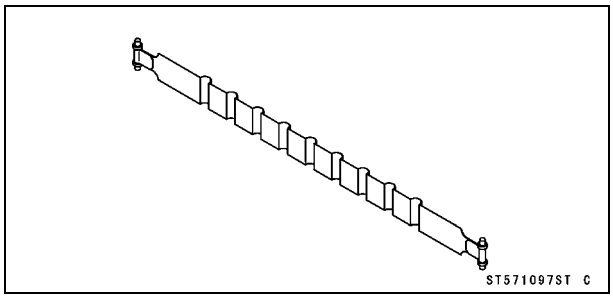
Valve Spring Compressor Assembly:
57001-241



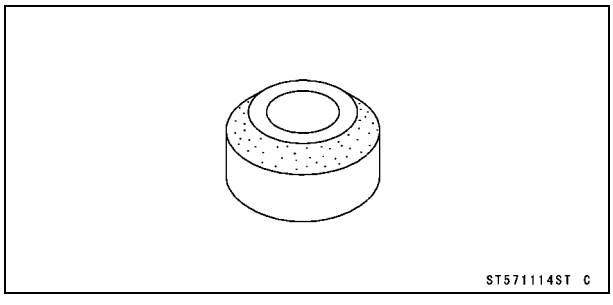
Piston Ring Compressor Grip:
57001-1095



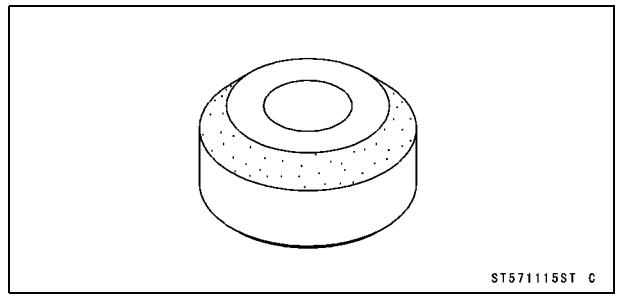
Piston Ring Compressor Belt, ϕ67 ~ ϕ79:
57001-1097



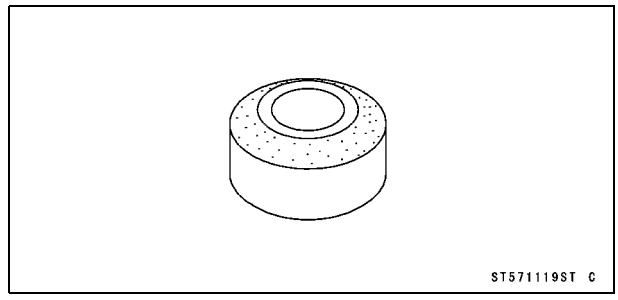
Valve Seat Cutter, 45° - ϕ27.5:
57001-1114



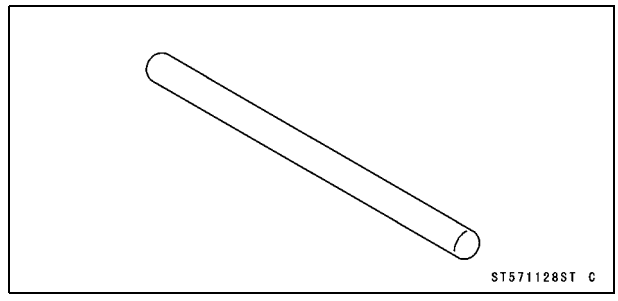
Valve Seat Cutter, 45° - ϕ32:
57001-1115



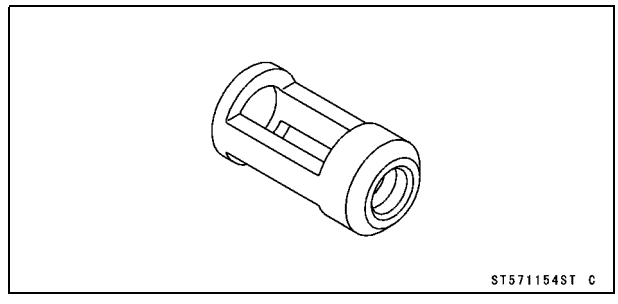
Valve Seat Cutter, 32° - ϕ28:
57001-1119



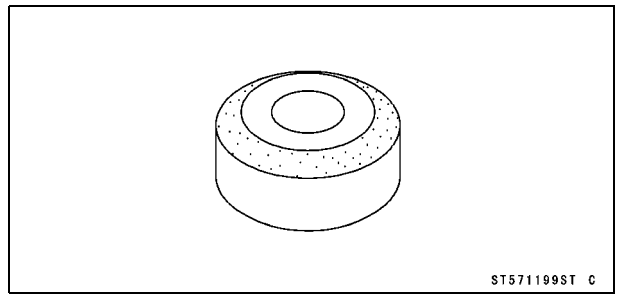
Valve Seat Cutter Holder Bar:
57001-1128



Valve Spring Compressor Adapter, ϕ20:
57001-1154

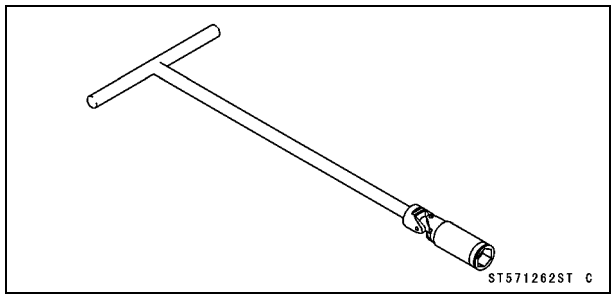


Valve Seat Cutter, 32° - ϕ33:
57001-1199

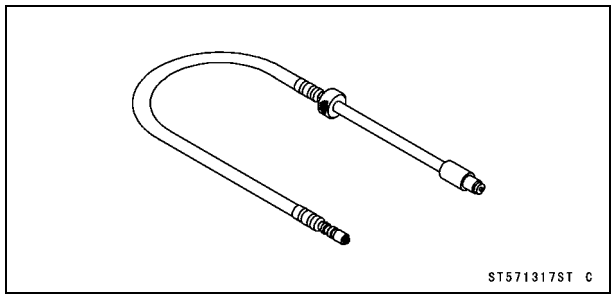


Special Tools & Sealant

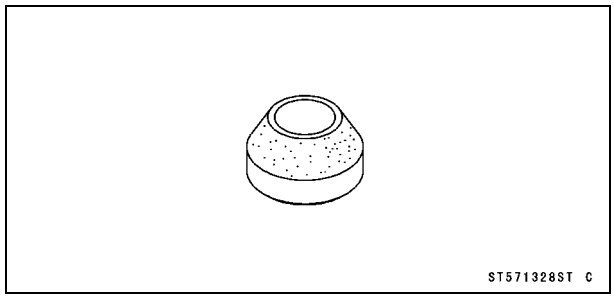
Spark Plug Wrench, Hex 16:
57001-1262



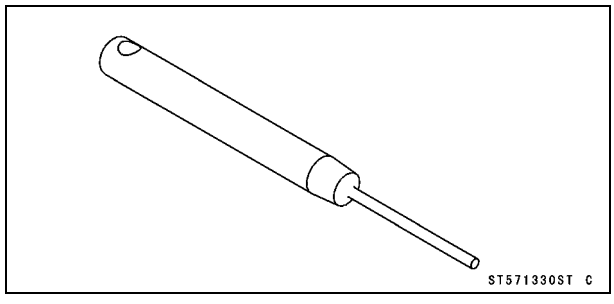
Compression Gauge Adapter, M10 × 1.0:
57001-1317



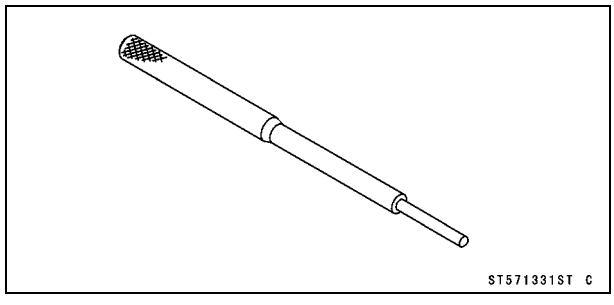
Valve Seat Cutter, 60° - ϕ25:
57001-1328



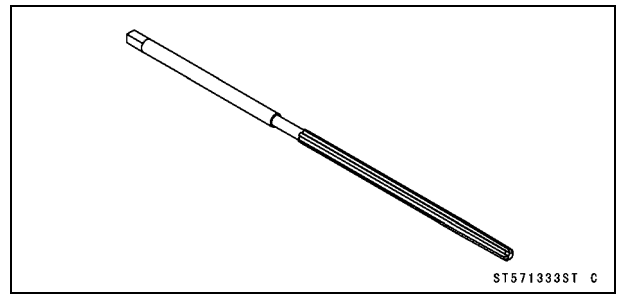
Valve Seat Cutter Holder, ϕ4.5:
57001-1330



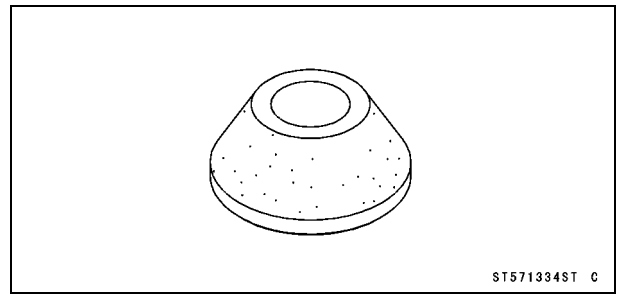
Valve Guide Arbor, ϕ4.5:
57001-1331



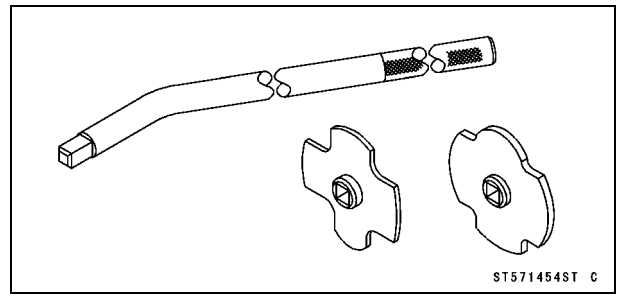
Valve Guide Reamer, ϕ4.5:
57001-1333



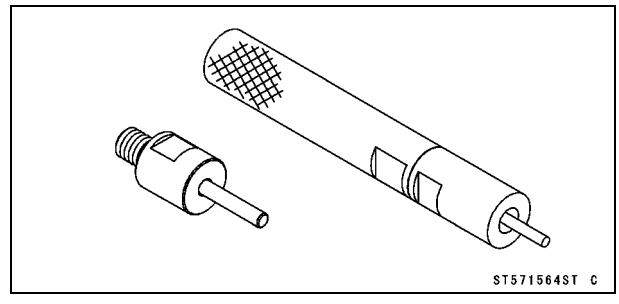
Valve Seat Cutter, 60° - ϕ33:
57001-1334



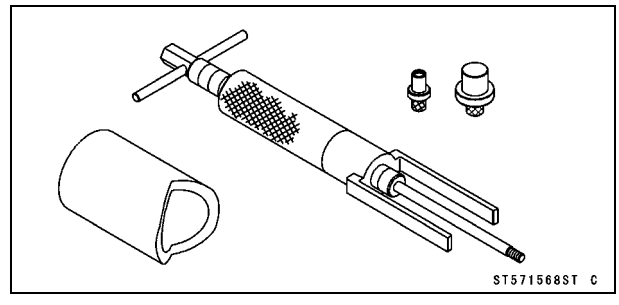
Filler Cap Driver:
57001-1454



Valve Guide Driver:
57001-1564

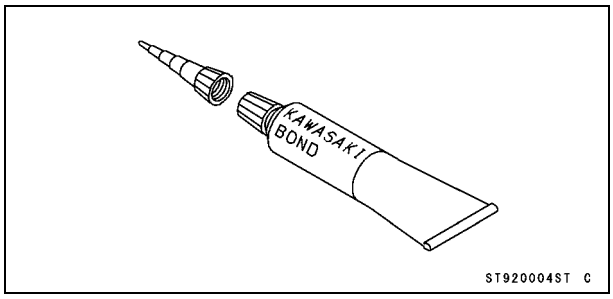


Piston Pin Puller:
57001-1568



Special Tools & Sealant

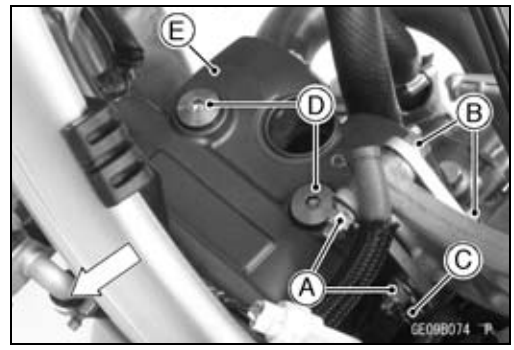
Kawasaki Bond (Silicone Sealant):
92104-0004



Cylinder Head Cover

Cylinder Head Cover Removal

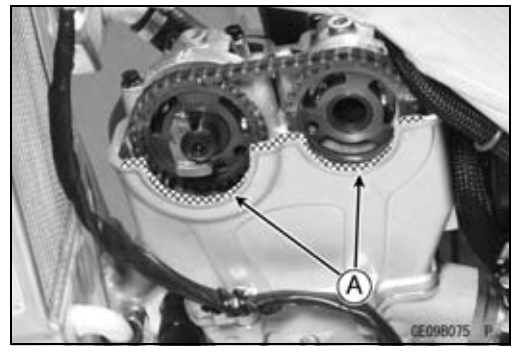
- Remove:
  Fuel Tank (see Fuel Tank Removal in the Fuel System chapter)
  Stick Coil (see Stick Coil Removal in the Electrical System chapter)
- Unscrew the bracket nuts [A] and remove the bolts [B].
- Loosen the mounting nut [C].
- Remove the cylinder head cover bolts [D] and remove the cylinder head cover [E] to left side of the frame.



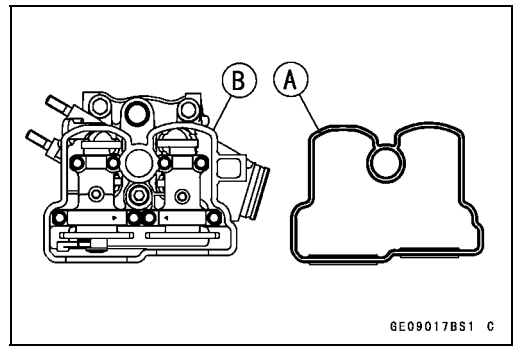
Cylinder Head Cover Installation

- Apply silicon sealant [A] to the cylinder head as shown.

Sealant - Kawasaki Bond (Silicone Sealant): 92104-0004



- Replace the head cover gasket.
- Install the head cover gasket [A] on the cylinder head [B].

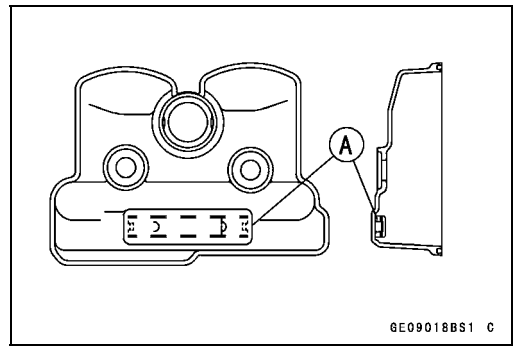


- Make sure that the upper chain guide [A] is bottomed.

CAUTION

Unless the upper chain guide is bottomed, the camshaft chain could push the cylinder head cover upward, leading to an oil leak.

- Install the head cover from the motorcycle left side.

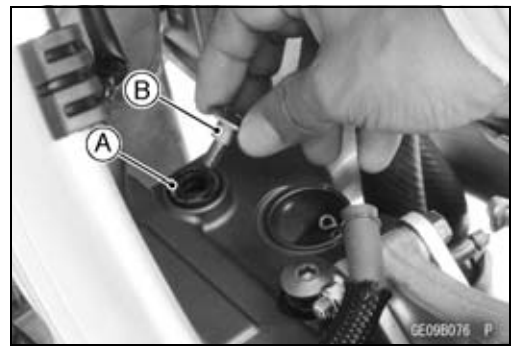


- Install the head cover bolt washers [A] with the metal side upwards.
- Tighten the cover bolt [B].

Torque - Cylinder Head Cover Bolt: 9.8 N·m (1.0 kgf·m, 87 in·lb)

- Install the stick coil.

○Pull up the stick coil lightly to make sure of the installation of the stick coil.



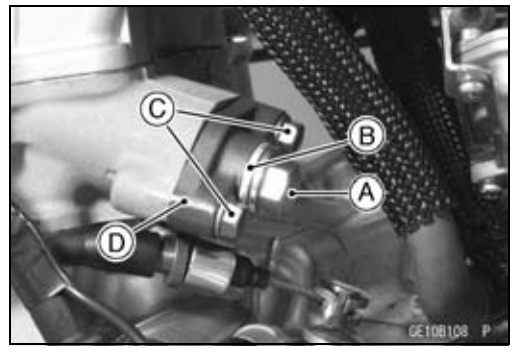
Camshaft Chain Tensioner

Camshaft Chain Tensioner Removal

CAUTION

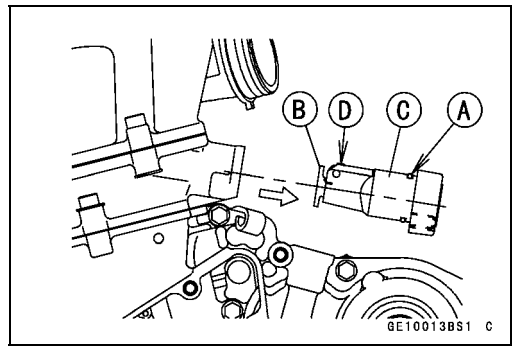
This is a non-return type camshaft chain tensioner. The push rod does not return to its original position once it moves out to take up camshaft chain slack. Observe all the rules listed below:
When removing the tensioner, do not take out the mounting bolts only halfway. Retightening the mounting bolts from this position could damage the tensioner and the camshaft chain. Once the bolts are loosened, the tensioner must be removed and reset as described in "Camshaft Chain Tensioner Installation".
Do not turn over the crankshaft while the tensioner is removed. This could upset the camshaft chain timing and damage the valves.

- Remove:
  Carburetor (see Carburetor Removal in the Fuel System chapter)
  Cap Bolt [A]
  Washer [B], Spring, Rod
- Remove the tensioner mounting bolts [C], and remove the chain tensioner body [D].



Camshaft Chain Tensioner Installation

- Replace the O-ring [A] with new one, and apply grease.
- Release the stopper and push the pushrod [B] into the tensioner body [C] fully.
- Install the tensioner body so that the stopper [D] faces up-ward.

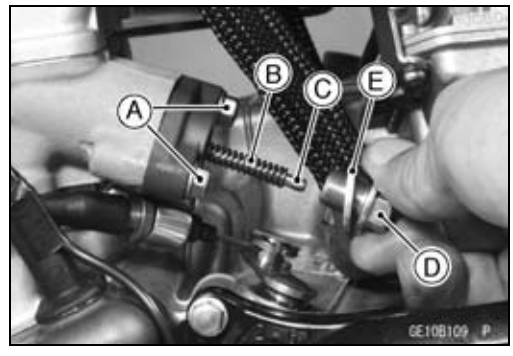


- Tighten the tensioner mounting bolts [A].

  Torque - Camshaft Chain Tensioner Mounting Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)

- Install the spring [B] and rod [C].
- Tighten the cap bolt [D] with the washer [E].

  Torque - Camshaft Chain Tensioner Cap Bolt: 20 N·m (2.0 kgf·m, 14.5 ft·lb)

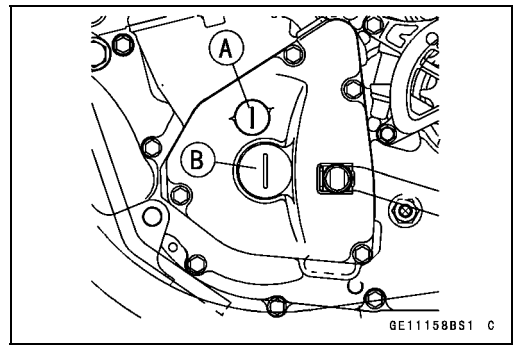


Camshaft

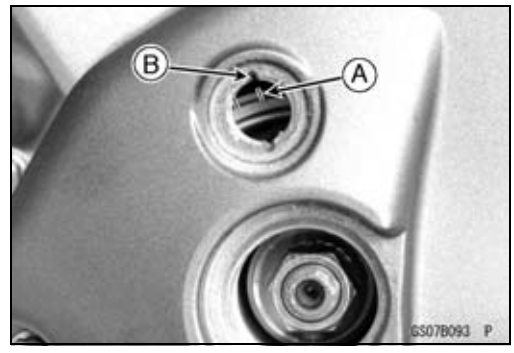
Camshaft Removal

● Remove:
Cylinder Head Cover (see Cylinder Head Cover Removal)
Timing Inspection Plug [A]
Flywheel Plug [B]

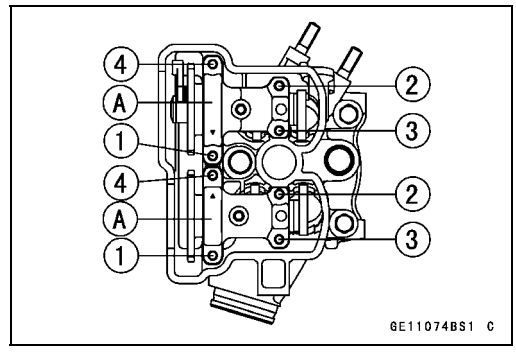
Special Tool - Filler Cap Driver: 57001-1454



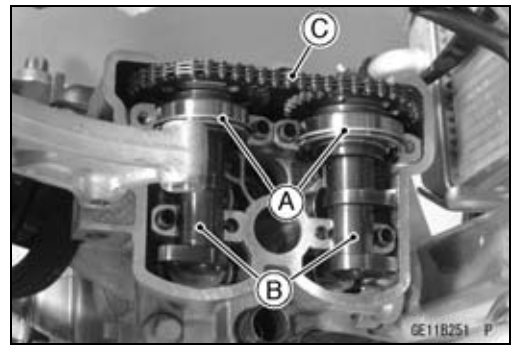
● First, bring the piston to the TDC (of either the compression or exhaust stroke).
○Place a wrench over the flywheel nut and turn it counterclockwise to align the TDC mark [A] with the center of the groove [B] of the inspection hole.



● Remove:
Camshaft Chain Tensioner (see Camshaft Chain Tensioner Removal)
Camshaft Cap Bolts [1 ~ 4] (sequence numbers)
Camshaft Caps [A]



● Remove:
Positioning Rings [A]
● Disengage the Camshafts [B] from camshaft chain [C].



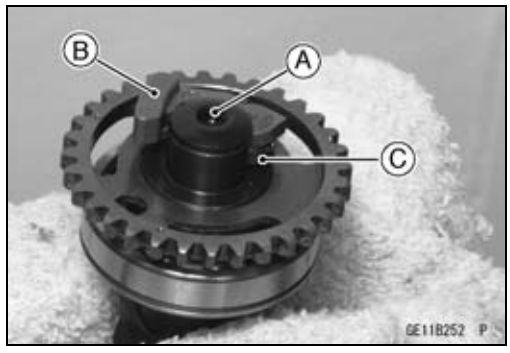
● Staff a clean cloth into the camshaft chain tunnel to keep any parts from dropping into the crankcase.

CAUTION

The crankshaft may be turned while the camshafts are removed.
Always pull the chain taut while turning the crankshaft. This avoids kinking the chain on the lower (crankshaft) sprocket. A kinked chain could damage both the chain and the sprocket.

Camshaft

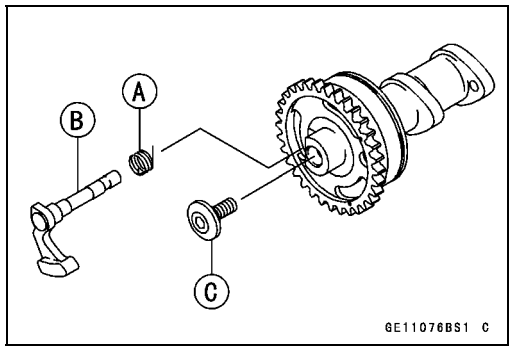
● Remove:
Bolt [A]
Auto-Decompressor [B]
Spring [C]



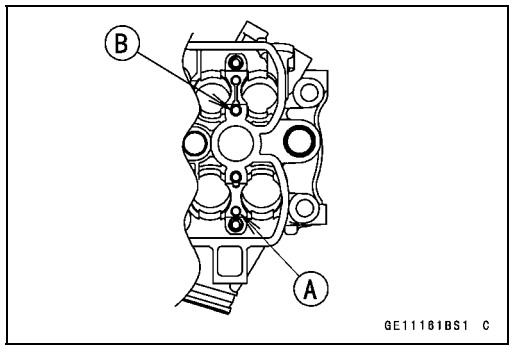
Camshaft Installation

● Install:
Spring [A]
Auto-Decompressor [B]
Bolt [C]

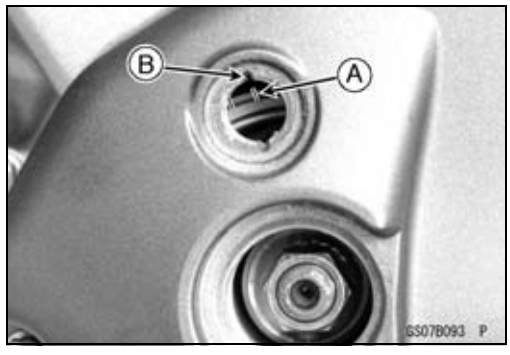
Torque - Auto-Decompressor Bolt: 12 N·m (1.2 kgf·m, 104 in·lb)



● Fill the oil passage of the cylinder head with molybdenum disulfide oil.
○Pure in the oil from the inlet oil passage hole [A] until the oil appear to exhaust oil passage hole [B].
● Apply molybdenum disulfide oil to the ball bearing, all cam and journal surfaces of the camshaft.
● If the camshaft is replaced with a new part, apply a thin coat of molybdenum disulfide grease to the cam and journal surfaces.

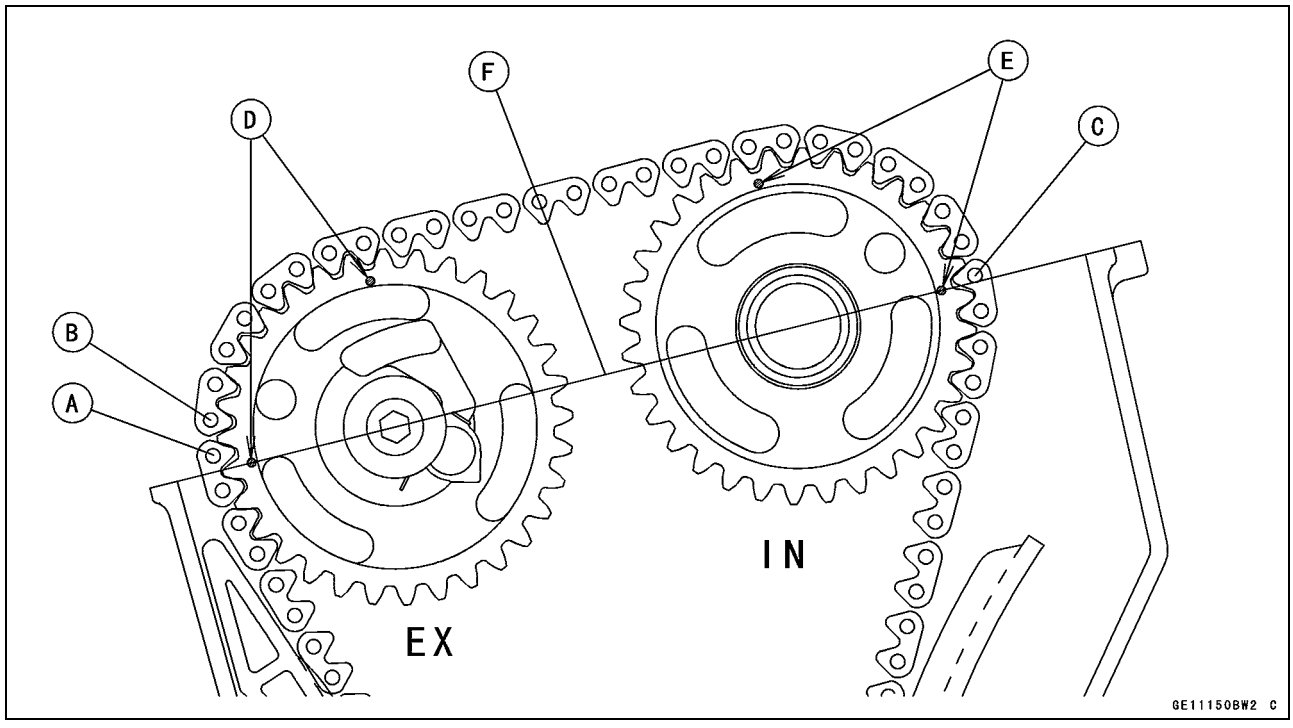


● First, bring the crankshaft to the TDC (of either the compression or exhaust stroke).
○Place a wrench over the flywheel nut and turn it counterclockwise to align the TDC mark [A] with the center of the groove [B] of the inspection hole.



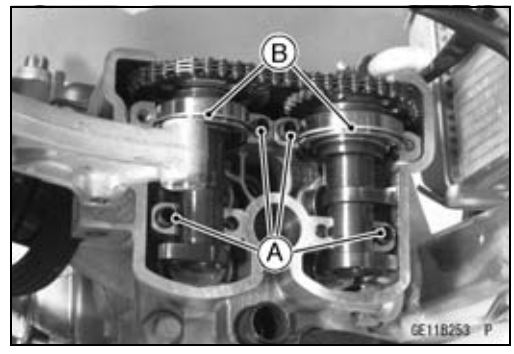
● Engage the camshaft chain with the camshaft sprockets.
○Pull the tension side (exhaust side) of the chain taut to install the chain.
○The timing marks on the exhaust sprocket must be aligned with the cylinder head upper surface and pointed toward the front.
● Pull the chain taut and fit it onto the camshaft sprocket.
● Starting with the timing mark on the front of the exhaust sprocket, count to the 1st pin. Feed the exhaust camshaft thought the chain and align the 28th pin with the timing mark on the inlet camshaft sprocket.

Camshaft

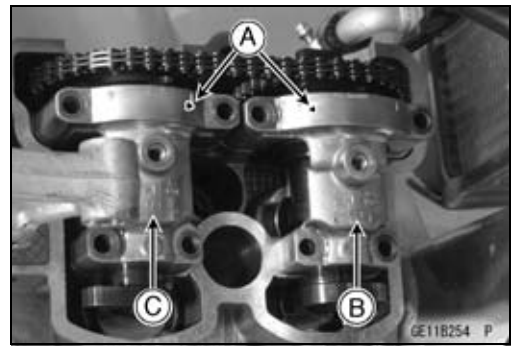


1st Pin [A]
2nd Pin [B]
28th Pin [C]
Punch Marks (exhaust) [D]
Punch Marks (inlet) [E]
Upper Cylinder Head Surface [F]

- Be sure to install the dowel pins [A] and positioning rings [B].



- Install the camshaft caps in their original positions by facing their triangle marks [A] face to face as shown in the photograph.
  EX mark [B]
  IN mark [C]

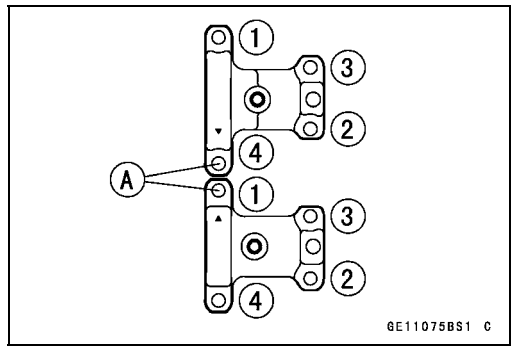


CAUTION
The camshaft caps are machined with the cylinder head, and the camshaft may seize if the caps are installed in a wrong position.

Camshaft

● Uniformly tighten all bolts and after the camshaft has settled, uniformly tighten all the bolts.
○Bolts [A] are long.
○Following the sequence numbers on the camshaft caps, tighten the cap bolts [1 ~ 4] after applying engine oil to the seat and thread of them.

Torque - Camshaft Cap Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)



● Install the camshaft chain tensioner (see Camshaft Chain Tensioner Installation), then, check the camshaft chain timing.

CAUTION

After this procedure, if any resistance is felt while turning over the crankshaft, stop immediately, and check the camshaft chain timing. Valves will be bent if the timing is not properly set.

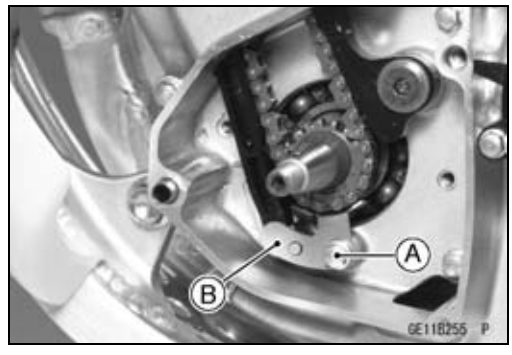
● Install the cylinder head cover (see Cylinder Head Cover Installation), timing inspection plug, and the flywheel plug.

Torque - Timing Inspection Plug: 4 N·m (0.4 kgf·m, 35 in·lb)
Flywheel Plug: 5 N·m (0.5 kgf·m, 44 in·lb)

Special Tool - Filler Cap Driver: 57001-1454

Camshaft Chain Removal

● Remove:
Camshaft (see Camshaft Removal)
Flywheel Magneto (see Flywheel Magneto Removal in the Electrical System)
Lower Camshaft Chain Guide Bolt [A]
Lower Chain Guide [B]
● Remove the camshaft chain from the crankshaft sprocket.

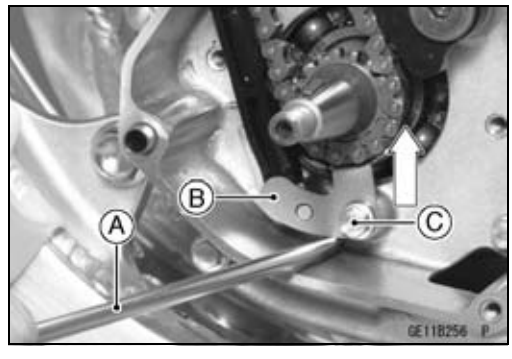


Camshaft Chain Installation

● Use the (–) driver [A] to bring the lower chain guide [B] upward.
● Tighten the chain guide bolt [C].

Torque - Lower Camshaft Chain Guide Bolt: 9.8 N·m (1.0 kgf·m, 87 in·lb)

● Install:
Flywheel Magneto (see Flywheel Magneto Installation in the Electrical System chapter)
Camshaft (see Camshaft Installation)



Camshaft

Camshaft and Camshaft Cap Wear Inspection

- Measure each clearance between the camshaft journal and camshaft cap using plastigauge (press gauge) [A].

○Tighten the camshaft cap bolts after applying engine oil to the seat and thread of them.

Torque - Camshaft Cap Bolt: 9.8 N·m (1.0 kgf·m, 87 in·lb)

NOTE

○*Do not turn the camshaft when the plastigauge is between the journal and camshaft cap.*

★If any clearance exceeds the service limit, measure the diameter of each camshaft journal with a micrometer.

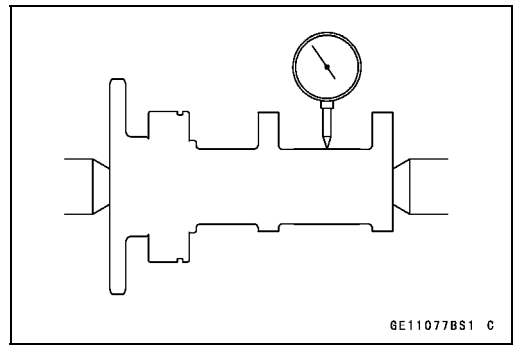
Camshaft Bearing Clearance
Standard: 0.020 ~ 0.062 mm (0.0008 ~ 0.0024 in.)
Service Limit: 0.15 mm (0.0059 in.)

★If the camshaft journal diameter is less than the service limit, replace the camshaft with a new one and measure the clearance again.

Camshaft Journal Diameter
Standard: 21.959 ~ 21.980 mm (0.8645 ~ 0.8654 in.)
Service Limit: 21.93 mm (0.8634 in.)

★If the clearance still remains out of the service limit, replace the cylinder head unit.

Camshaft Runout Inspection

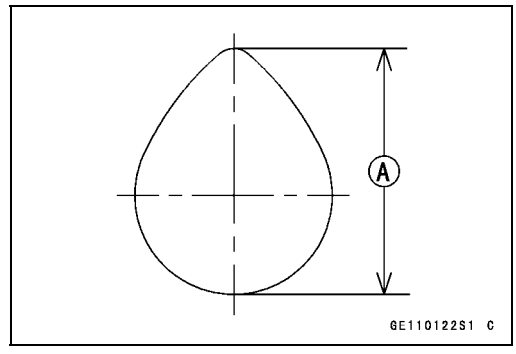


- Remove the camshaft (see Camshaft Removal).
- Set the camshaft in a camshaft alignment jig or on V blocks.
- Measure the runout with a dial gauge at the specified place as shown.

★If the runout exceeds the service limit, replace the camshaft.

Camshaft Runout
Standard: TIR 0.02 mm (0.0008 in.) or less
Service Limit: TIR 0.1 mm (0.0039 in.)

Cam Wear Inspection



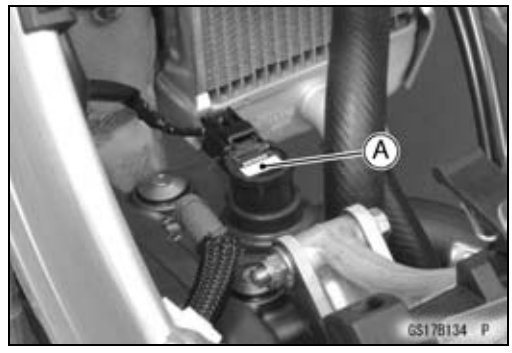
- Remove the camshaft (see Camshaft Removal).
- Measure the height [A] of each cam with a micrometer.

★If the cams are worn down past the service limit, replace the camshaft.

Cam Height
Standard:
Exhaust 33.941 ~ 34.057 mm (1.3363 ~ 1.3408 in.)
Inlet 34.642 ~ 34.758 mm (1.3639 ~ 1.3684 in.)
Service Limit:
Exhaust 33.84 mm (1.3322 in.)
Inlet 34.54 mm (1.3598 in.)

Cylinder Head

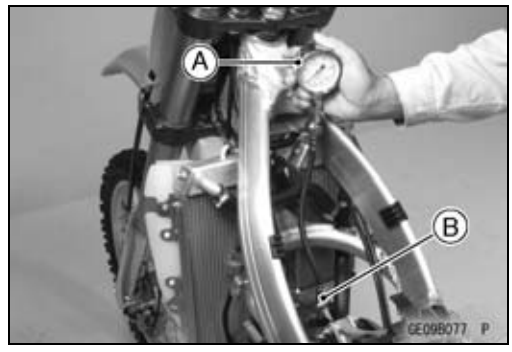
Cylinder Compression Measurement



- Start the engine.
- Thoroughly warm up the engine so that the engine oil between the piston and cylinder wall will help seal compression as it does during normal running.
- Stop the engine.
- Remove:
  Fuel Tank (see Fuel Tank Removal in the Fuel System chapter)
  Stick Coil (see Stick Coil Removal in the Electrical System)[A]
  Spark Plug (see Spark Plug Cleaning and Inspection in the Periodic Maintenance chapter)

Special Tool - Spark Plug Wrench, Hex 16: 57001-1262

Owner's Tool - Spark Plug Wrench: 92110-1172



- Attach the compression gauge [A] and the compression gauge adapter [B] firmly into the spark plug hole.
- With the throttle fully open, turn the engine over sharply with the kickstarter several times until the compression gauge stops rising; the compression is the highest reading obtainable.

Special Tools - Compression Gauge: 57001-221
Compression Gauge Adapter: 57001-1317

Cylinder Compression
Service Range: 431 ~ 706 kPa (4.4 ~ 7.2 kgf/cm², 62.6 ~ 102 psi)@ 5 kicks

- Install the spark plug.

Torque - Spark Plug: 13 N·m (1.3 kgf·m, 113 in·lb)

- Pull the stick coil lightly to make sure the installation of the stick coil.

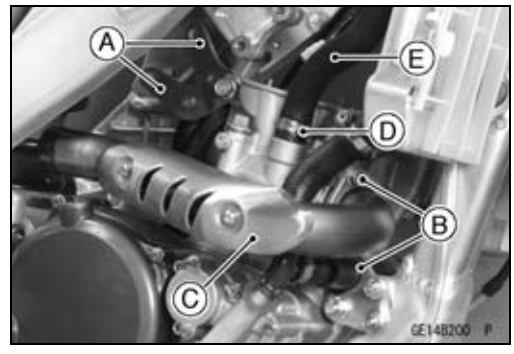
Cylinder Head

Problem	Diagnosis	Remedy (Action)
The cylinder compression is higher than the usable range	Carbon accumulation on piston and in cylinder head (combustion chamber) is suspected due to damaged valve stem or piston oil rings.	Remove the carbon deposits and replace damaged parts if necessary.
	Incorrect cylinder head gasket thickness.	Replace the gasket with a standard one.
	Damaged auto-decompressor spring or decompressor do not move smoothly.	Replace the spring or auto -decompressor.
The cylinder compression is lower than the usable range	Exhaust gas leakage around cylinder head.	Replace the damaged gasket and check cylinder head warp.
	Incorrect seating surface of valve.	Repair seating surface if possible.
	Valve clearance is too narrow.	Adjust the valve clearance.
	Piston/cylinder clearance is too wide.	Replace the piston and/or cylinder
	Piston seizure.	Inspect the cylinder and piston; repair or replace them if necessary.
	Bad condition of piston ring and/or piston ring grooves.	Replace the piston and/or the piston rings.
	Auto-decompressor do not move smoothly.	Replace the auto-decompressor.

Cylinder Head Removal

● Remove:
Fuel Tank (see Fuel Tank Removal in the Fuel System chapter)
Carburetor (see Carburetor Removal in the Fuel System chapter)
Camshaft Chain Tensioner (see Camshaft Chain Tensioner Removal)
Cylinder Head Cover (see Cylinder Head Cover Removal)
Camshaft (see Camshaft Removal)

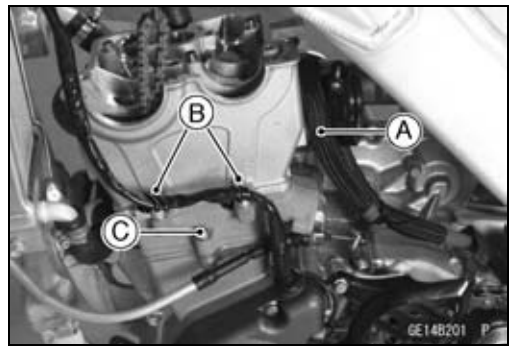
● Remove:
Engine Bracket [A]
Nuts [B]
Exhaust Pipe [C]
Clamp Screw [D] (loosen)
Water Hose [E]



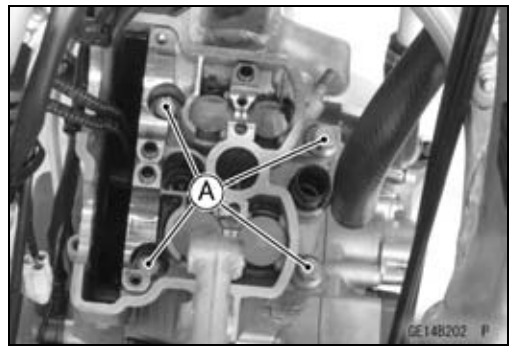
Cylinder Head

- Remove the breather hose [A] from the right crankcase.
- Remove the 6 mm cylinder head bolts [B] and loosen the cylinder bolt [C].

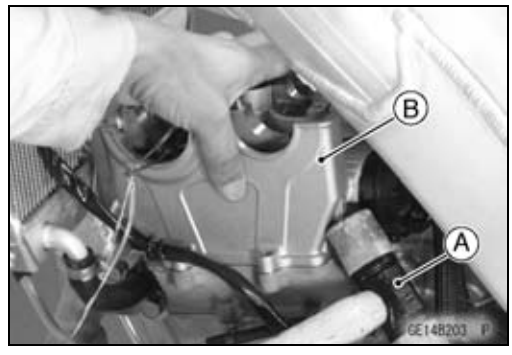
○This prevents the 6 mm bolts from becoming damaged.



- Remove the 10 mm cylinder head bolts [A].



- Tap lightly up with a plastic mallet [A] to separate the cylinder head [B] from the cylinder.

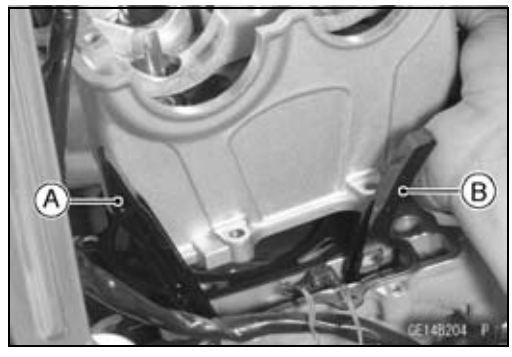


- Pull the cylinder head upward.

○Do not damage the radiator core.

○Clear the front [A] and rear [B] chain guides.

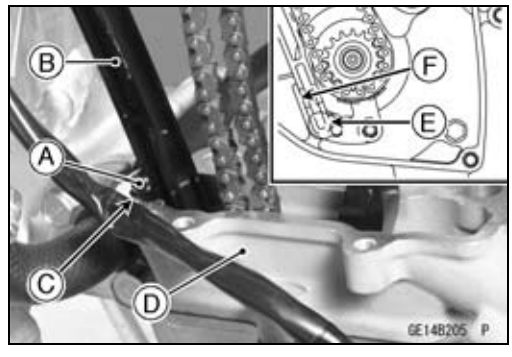
- Remove the cylinder head gasket.



Cylinder Head Installation

- Fit the projection [A] of the front camshaft chain guide [B] in the groove [C] of the cylinder [D].

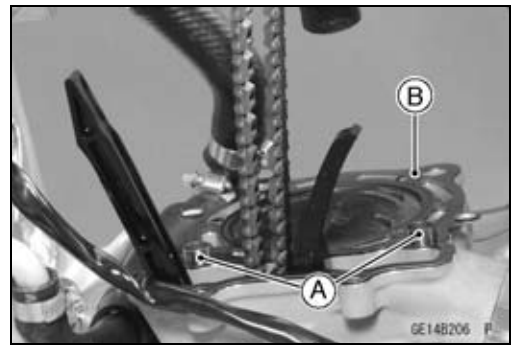
○Insert the guide end [E] into the recess [F] of the crankcase securely.



Cylinder Head

- Install:
  Dowel Pins [A]
  New Cylinder Head Gasket [B]
- Install the cylinder head.

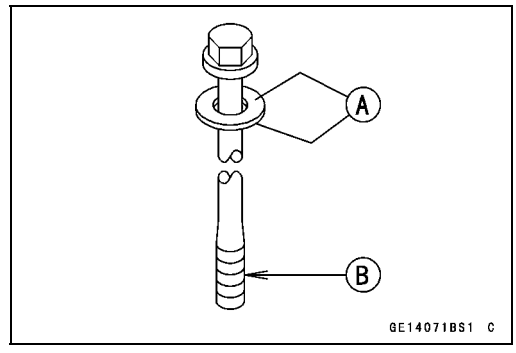
○The camshaft caps are machined with the cylinder head; therefore, if a new cylinder head is installed, use the caps that are supplied with the new head.



- Replace all the 10 mm cylinder head bolt washers with new ones.

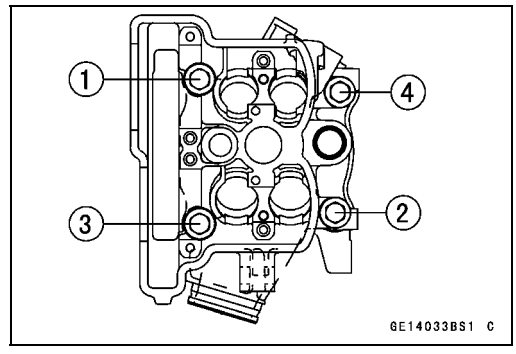
○The 10 mm cylinder head bolt washers are copper-plated, and they could leak oil if reused.

- Apply molybdenum disulfide oil to the following areas.
  10 mm Cylinder Head Bolt Washer, both sides [A]
  10 mm Cylinder Head Bolt Thread [B]



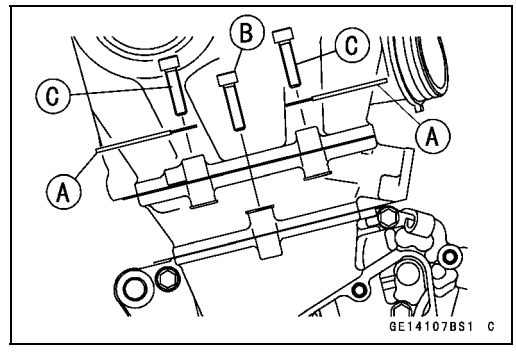
- Tighten the 10 mm cylinder head bolts in the numbered sequence [1 ~ 4].

Torque - Cylinder Head Bolt M10: 49 N·m (5.0 kgf·m, 36 ft·lb)



- Install the clamps [A]. (see Cable, Wire, and Hose Routing in the Appendix chapter)
- Tighten the 6 mm bolts.
  M6 Cylinder Bolt [B]
  M6 Cylinder Head Bolt [C]

Torque - Cylinder Bolt M6: 12 N·m (1.2 kgf·m, 104 in·lb)
Cylinder Head Bolts M6: 12 N·m (1.2 kgf·m, 104 in·lb)



- Install:
  Camshaft (see Camshaft Installation)
  Cylinder Head Cover (see Cylinder Head Cover Installation)
  Upper Engine Bracket (see Engine Removal/Installation chapter)

Torque - Engine Mounting Bolts: 49 N·m (5.0 kgf·m, 36 ft·lb)
Engine Bracket Nut: 29 N·m (3.0 kgf·m, 22 ft·lb)

Cylinder Head

- Tighten the water hose clamp screw.
- Install:
  Carburetor (see Carburetor Installation in the Fuel System chapter)
  Fuel Tank (see Fuel Tank Installation in the Fuel System chapter)
  Exhaust Pipe (see Muffler Installation)

Cylinder Head Cleaning

- Refer to the Cylinder Head Warp Inspection in the Periodic Maintenance chapter.

Cylinder Head Warp Inspection

- Refer to the Cylinder Head Warp Inspection in the Periodic Maintenance chapter.

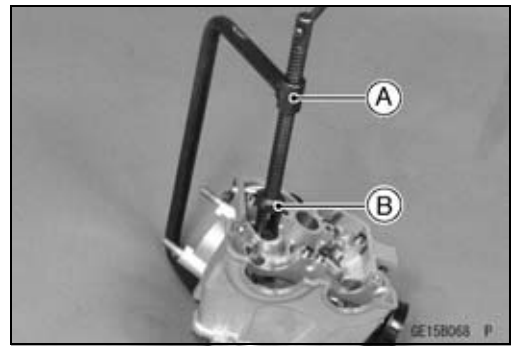
Valves

Valve Clearance Inspection

○Refer to the Valve Clearance Inspection in the Periodic Maintenance chapter.

Valve Removal

- Remove the cylinder head (see Cylinder Head Removal).
- Remove the valve lifter and the shim from the valve.



NOTE

○*Use the valve spring compressor assembly [A] and the adapter [B] to press down the valve spring retainer.*

Special Tools - Valve Spring Compressor Assembly: 57001 -241
Valve Spring Compressor Adapter, ϕ20: 57001-1154

Valve Installation

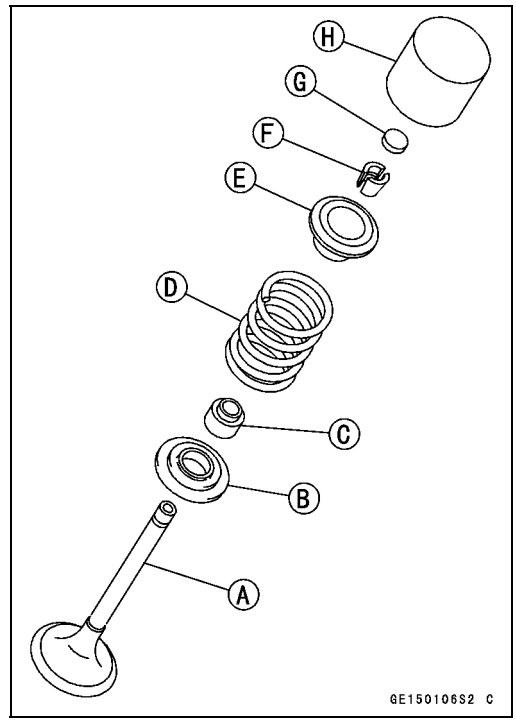
CAUTION

Do not lap the valve to the valve seat, using the grinding compound. It will come off oxide film treated surface of the valve.

- Visually inspect the valve surface.

★If the surface is damaged, replace it.

- Replace the oil seal [C] with a new one.
- Apply a thin coat of molybdenum disulfide grease to the valve stem [A] before installing the valve.
- Check to make sure that the valve moves up and down smoothly.
- Check to make sure that the valve and the valve seat are making proper contact.
- Install the valve spring so that the closed coil end [D] faces the spring seat [B].



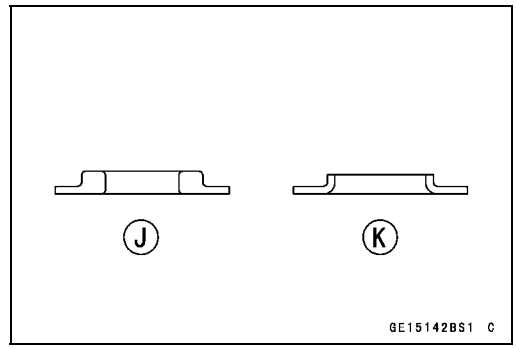
NOTE

○*There is a two rind of slave spring seat of the inlet valve and exhaust valve. Do not mistake to install them at valve installation.*

Inlet Valve Spring Seat [J]
Exhaust Valve Spring Seat [K]

- Compress the valve spring to install the split keepers [F] in order to secure the spring retainer [E] in place.

Special Tools - Valve Spring Compressor Assembly: 57001 -241
Valve Spring Compressor Adapter, ϕ20: 57001-1154



- The shim [G] must be installed with its thickness indication facing up towards the retainer.

○Apply high temperature grease to the shim or to the retainer to prevent the shim from falling off when the camshaft is being installed.

- Apply engine oil to the valve lifter [H] surface; then install the lifter.

Valves

Valve Guide Removal

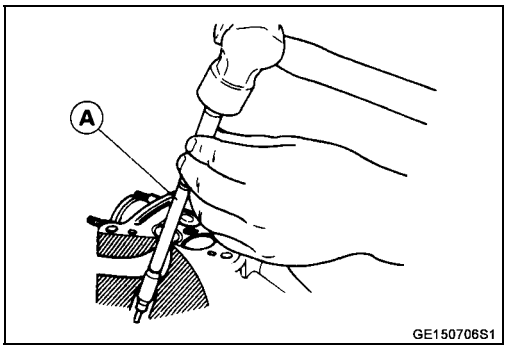
- Remove:
  Valve (see Valve Removal)
  Oil Seal
  Spring Seat
- Heat the area around the valve guide up to 120 ~ 150°C (248 ~ 302°F).

CAUTION

Do not heat the cylinder head with a torch. This will warp the cylinder head. Soak the cylinder head and heat the oil.

- Hammer lightly on the valve guide arbor [A] to remove the guide.

Special Tool - Valve Guide Arbor, ϕ4.5: 57001-1331



Valve Guide Installation

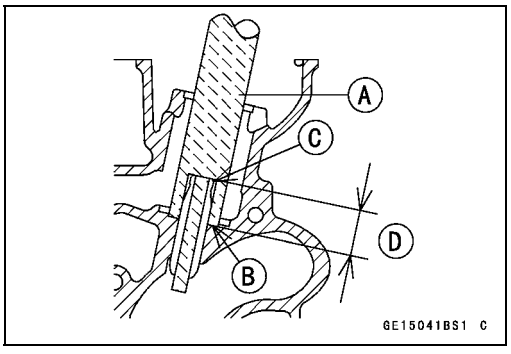
- Apply a thin coat of oil to the outer surface of the valve guide.
- Heat the area around the valve guide up to 120 ~ 150°C (248 ~ 302°F).

CAUTION

Do not heat the cylinder head with a torch. This will warp the cylinder head. Soak the cylinder head and heat the oil.

- Using the valve guide driver [A], press and insert the valve guide in until the valve guide driver surface [B] touches the cylinder head surface.
  Valve Guide Upper Surface [C]
  13.8 ~ 14.0 mm (13.8 ~ 14.0 mm) [D]

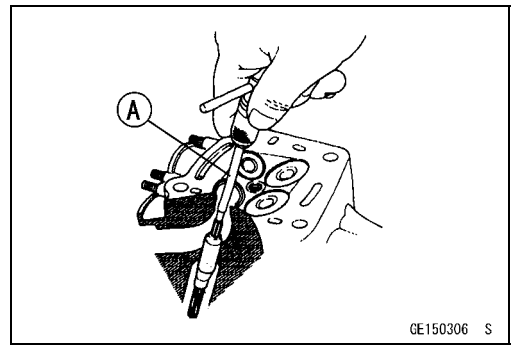
Special Tool - Valve Guide Driver, ϕ4.5: 57001-1564



Valves

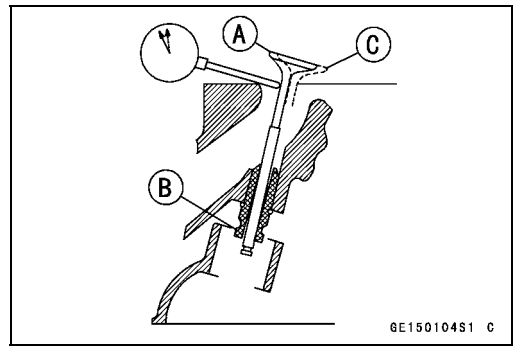
● Ream the valve guide with valve guide reamer [A], even if the old guide is reused.
○Always rotate the reamer clockwise.

Special Tool - Valve Guide Reamer, ϕ4.5: 57001-1333



Valve/Valve Guide Clearance Measurement (Wobble Method)

○If a small bore gauge is not available, inspect the valve guide wear by measuring the valve/valve guide clearance with the wobble method as indicated below.
● Insert a new valve [A] into the guide [B] and set a dial gauge against the stem perpendicular to it as close as possible to the cylinder head mating surface.
● Move the stem back and forth [C] to measure the valve wobble.



● Repeat the measurement in a direction at a 90° angle to the first measurement.
★If the reading exceeds the service limit, replace the guide.

NOTE

○*The reading is greater than the actual valve/valve guide clearance because the measurement is taken outside of the guide.*

Valve/Valve Guide Clearance Measurement (Wobble Method)

Standard:

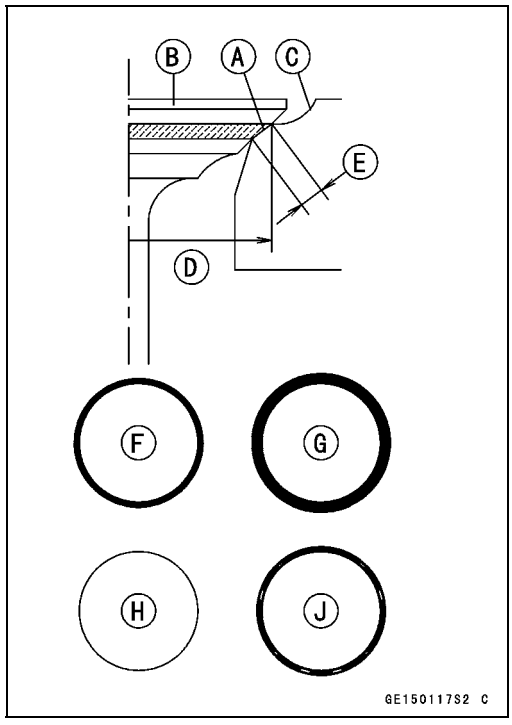
Exhaust	**0.08 ~ 0.16 mm (0.0031 ~ 0.0063 in.)**
Inlet	**0.03 ~ 0.10 mm (0.0012 ~ 0.0039 in.)**

Service Limit:

Exhaust	**0.32 mm (0.0126 in.)**
Inlet	**0.26 mm (0.0102 in.)**

Valves

Valve Seat Inspection



- Remove the valve (see Valve Removal).
- Check the valve seating surface [A] between the valve [B] and valve seat [C].
- Measure the outside diameter [D] of the seating pattern on the valve seat.

★If the outside diameter is too large or too small, repair the seat. (see Seat Repair)

Valve Seating Surface Outside Diameter

Exhaust	**24.62 ~ 24.82 mm (0.9693 ~ 0.9772 in.)**
Inlet	**30.62 ~ 30.82 mm (1.2055 ~ 1.2134 in.)**

- Check the seating surface width of the valve seat.

○Measure the seat width [E] of the portion where there is no build-up carbon (white portion) of the valve seat with a vernier caliper.

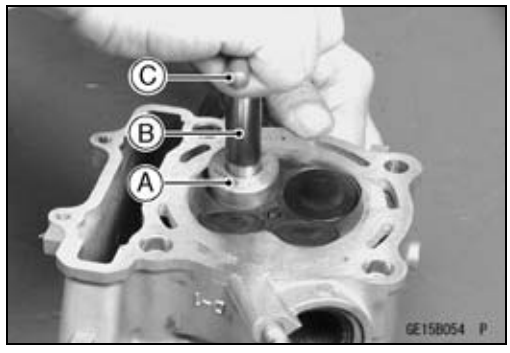
Good [F]

Valve Seating Surface Width Standard

Exhaust	**0.5 ~ 1.0 mm (0.0197 ~ 0.0394 in.)**
Inlet	**0.5 ~ 1.0 mm (0.0197 ~ 0.0394 in.)**

★If the width is too wide [G] , too narrow [H] or uneven [J], repair the seat (see Valve Seat Repair).

Valve Seat Repair



- For the instructions on how to use the valve seat cutter [A], follow the operation manual provided by the tool manufacturer.

Special Tools - Valve Seat Cutter Holder, ϕ4.5: 57001-1330 [B]
Valve Seat Cutter Holder Bar: 57001-1128 [C]

Exhaust: Valve Seat Cutter, 45° - ϕ27.5 : 57001- 1114
Valve Seat Cutter, 32° - ϕ28: 57001-1119
Valve Seat Cutter, 60° - ϕ25: 57001-1328
Inlet: Valve Seat Cutter, 45° - ϕ32: 57001-1115
Valve Seat Cutter, 32° - ϕ33: 57001-1199
Valve Seat Cutter, 60° - ϕ33: 57001-1334

★If the tool manufacturer's instructions are not available, operate in accordance with the following procedure.

Valves

Seat Cutter Operation Care:

1. This valve seat cutter is developed to grind the vale for repair. Therefore the cutter must not be used for other purposes than seat repair.
2. Do not drop or shock the valve seat cutter, or the diamond particles may fall off.
3. Do not fail to apply engine oil to the valve seat cutter before grinding the seat surface. Also wash off ground particles sticking to the cutter with washing oil.

NOTE

○*Do not use a wire brush to remove the metal particles from the cutter. It will take off the diamond particles.*

4. Setting the valve seat cutter holder in position, operate the cutter in one hand. Do not apply too much force to the diamond portion.

NOTE

○*Prior to grinding, apply engine oil to the cutter and during the operation, wash off any ground particles sticking to the cutter with washing oil.*

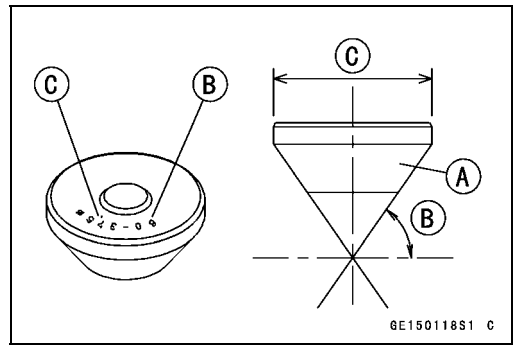
5. After use, wash it with washing oil and apply thin layer of engine oil before storing.

Marks Stamped on the Cutter:

The marks stamped on the back of the cutter [A] represent the following.

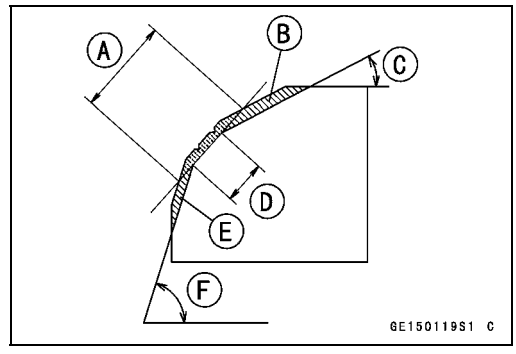
60° ..... Cutter Angle [B]

37.5ϕ ..... Cutter Outer Diameter [C]



Repair Operating Procedures

- Clean the seat area carefully.
- Coat the seat with machinist's dye.
- Fit a 45° cutter into the holder and slide it into the valve guide.
- Press down lightly on the handle and turn it right or left. Grind the seating surface only until it is smooth.



CAUTION

Do not grind the seat too much. Overgrinding will reduce valve clearance by sinking the valve into the head. If the valve sinks too far into the head, it will be impossible to adjust the clearance, and the cylinder head must be replaced.

Widened Width [A] of engagement by machining with 45° cutter
Ground Volume [B] by 32° cutter
32° [C]
Correct Width [D]
Ground Volume [E] by 60° cutter
60° [F]

Valves

● Measure the outside diameter [O.D.] of the seating surface with a vernier caliper.

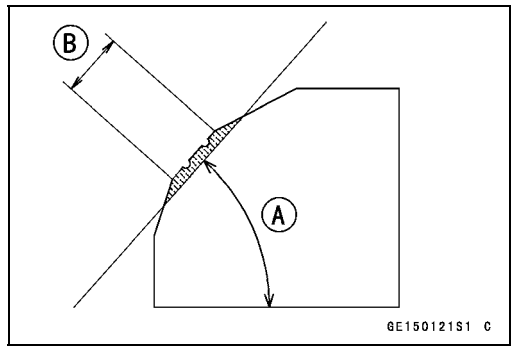
★If the outside diameter of the seating surface is too small, repeat the 45° grind until the diameter is within the specified range.

Original Seating Surface [B]

○Remove all pittings of flaws from 45° ground surface.

○Alter grinding with 45° cutter, apply thin coat of machinist's dye to 45° [A] seating surface. This makes seating surface distinct and 32° and 60° grinding operation easier.

○When the valve guide is replaced, be sure to grind with 45° cutter for centering and good contact.



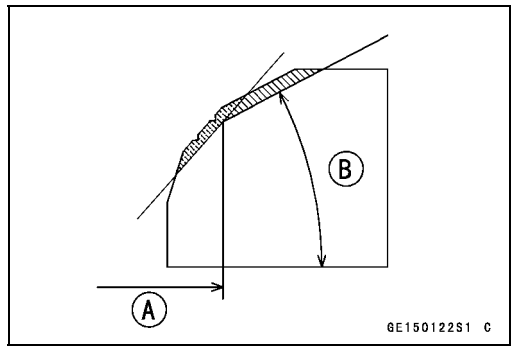
★If the outside diameter [A] of the seating surface is too large, make the 32° grind described below.

★If the outside diameter of the seating surface is within the specified range, measure the seat width as described below.

● Grind the seat at a 32° angle [B] until the seat O.D. is within the specified range.

○To make the 32° grind, fit a 32° cutter into the holder, and slide it into the valve guide.

○Turn the holder one turn at a time while pressing down very lightly. Check the seat after each turn.



CAUTION

The 32° cutter removes material very quickly. Check the seat outside diameter frequently to prevent overgrinding.

○After making the 32° grind, return to the seat O.D. measurement step above.

● To measure the seat width, use a vernier caliper to measure the width of the 45° angle portion of the seat at several places around the seat.

★If the seat width is too narrow, repeat the 45° grind until the seat is slightly too wide, and then return to the seat O.D. measurement step above.

★If the seat width is too wide, make the 60° [A] grind described below.

★If the seat width is within the specified range, lap the valve to the seat as described below.

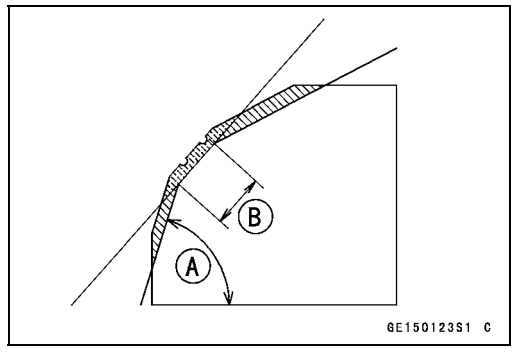
● Grind the seat at a 60° angle until the seat width is within the specified range.

○To make the 60° grind, fit a 60° cutter into the holder, and slide it into the valve guide.

○Turn the holder, while pressing down lightly.

○After making the 60° grind, return to the seat width measurement step above.

Correct Width [B]



Valves

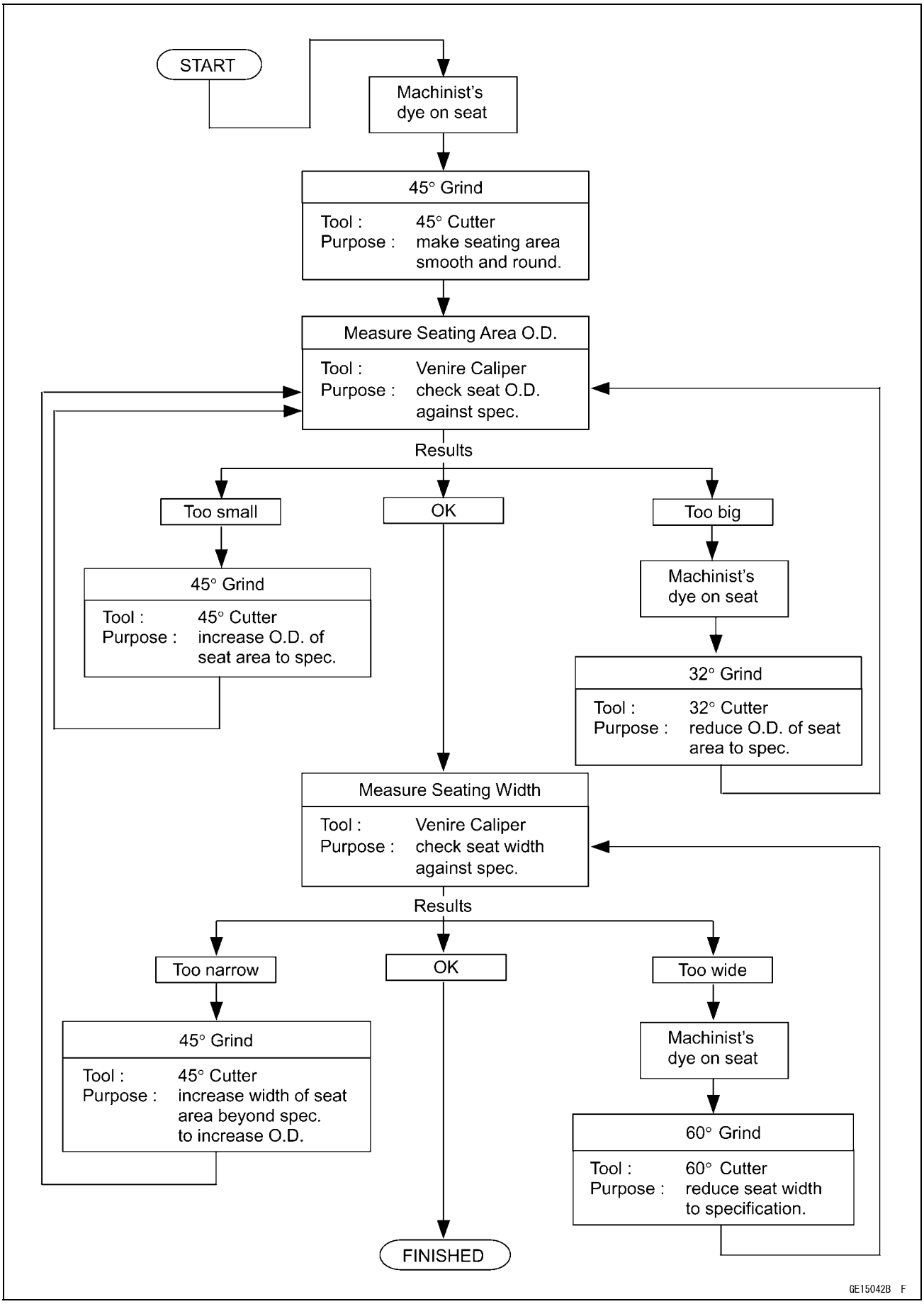
- The seating area should be marked about in the middle of the valve face.

★If the seat area is not in the right place on the valve, check to be sure the valve is the correct part. If it is, it may have been refaced too much; replace it.

- When the engine is assembled, be sure to adjust the valve clearance (see Engine Top End in the Periodic Maintenance chapter).

Valves

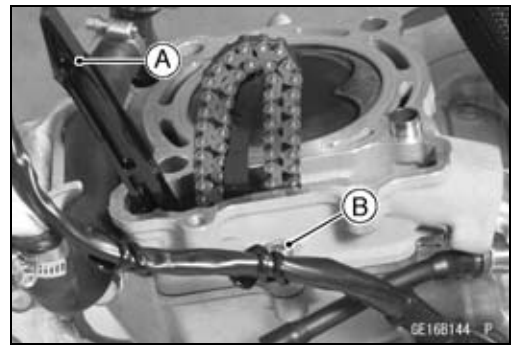
Valve Seat Repair



Cylinder and Piston

Cylinder Removal

- Remove:
  Cylinder Head (see Cylinder Head Removal)
  Front Camshaft Chain Guide [A]
  Cylinder Bolt [B]
- Tap lightly up with a plastic mallet to separate the cylinder from the crankcase.
- Remove the cylinder base gasket.

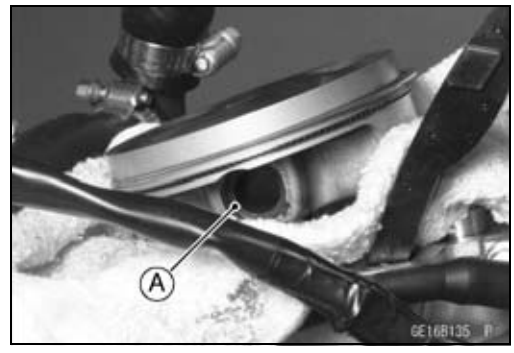


Piston Removal

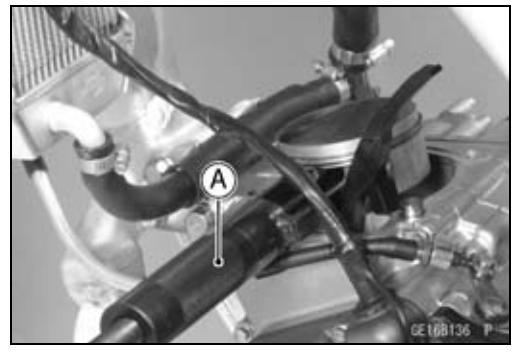
- Remove the cylinder (see Cylinder Removal).
- Place a clean cloth under the piston and remove the piston pin snap ring [A] from one end of the piston pin.

CAUTION

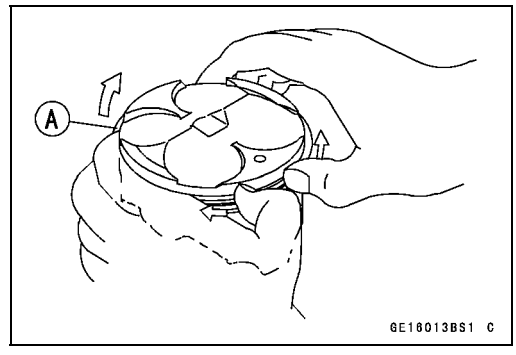
Do not reuse snap rings, as removal weakens and deforms them. They could fall out and score the cylinder wall.



- Remove the piston pin, using a piston pin puller.
  Special Tool - Piston Pin Puller Assembly: 57001-1568 [A]
- Remove the piston.



- Carefully spread the ring opening with your thumbs and then push up on the opposite side of the ring [A] to remove it.
- Remove the oil ring in the same procedure.



Cylinder and Piston Installation

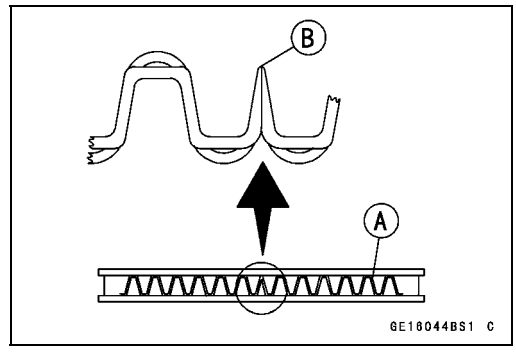
NOTE

○*The oil ring rails have no "top" or "bottom".*

- Install the oil ring expander [A] in the bottom piston ring groove so the ends [B] butt together.
- Install the oil ring steel rails, one above the expander and one below it.

○Spread the rail with your thumbs, but only enough to fit the rail over the piston.

○Release the rail into the bottom piston ring groove.

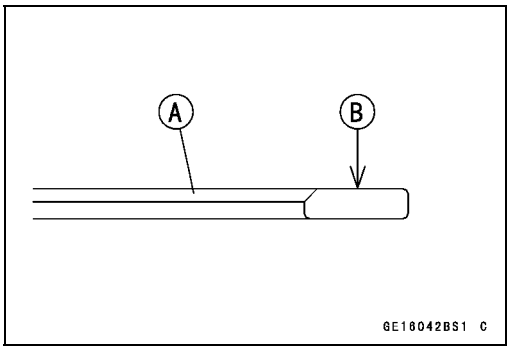


Cylinder and Piston

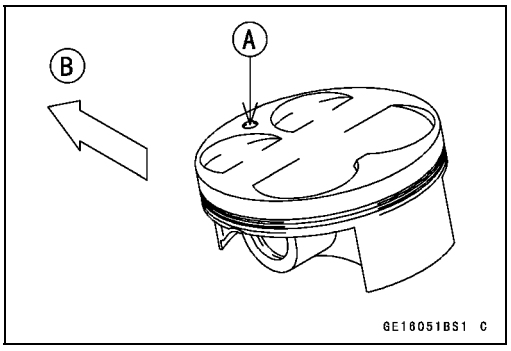
● Install the top ring [A] so that the "R" mark [B] faces up.

NOTE

○*If a new piston or cylinder is used, check piston to cylinder clearance (see Piston/Cylinder Clearance), and use new piston rings.*



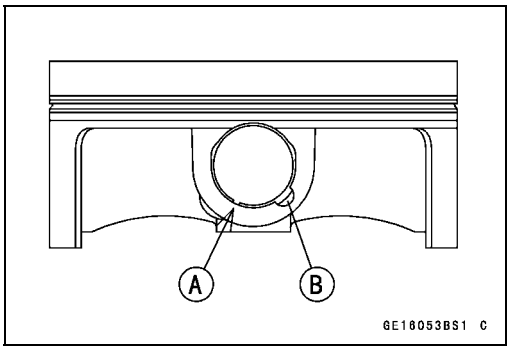
● Apply engine oil to the inside wall of the small end of the connecting rod.
● Face the circle mark [A] on the top of the piston must point toward the front [B] of the engine.



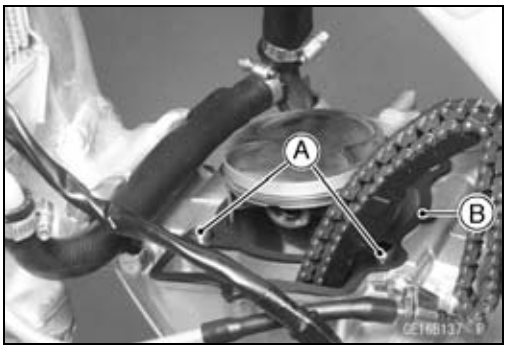
● Fit a new piston pin snap ring into the side of the piston so that the ring opening [A] does not coincide with the slit [B] of the piston pin hole.
○When installing the piston pin snap ring, compress it only enough to install it and no more.

CAUTION

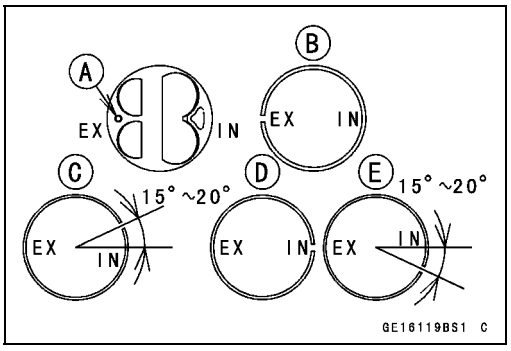
Do not reuse snap rings, as removal weakens and deforms them. They could fall out and score the cylinder wall.



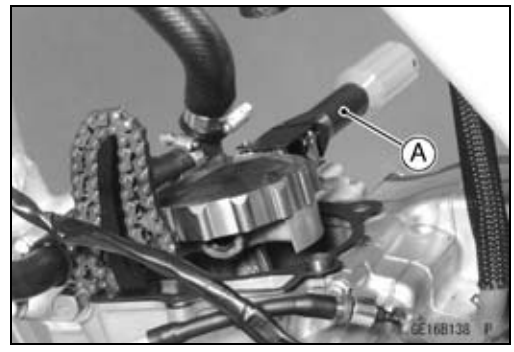
● Install:
Dowel Pins [A]
New Cylinder Base Gasket [B]



● The piston ring openings must be positioned as shown in the figure. The openings of the oil ring steel rails must be 15° ~ 20° of angle from the opening of the oil ring expander.
Circle Mark [A]
Top Ring [B]
Upper Oil Ring Steel Rails [C]
Oil Ring Expander [D]
Lower Oil Ring Steel Rail [E]



Cylinder and Piston



- Apply engine oil to the cylinder bore.
- Determine the position of the piston ring ends.
- Install the cylinder while compressing the piston rings with your fingers or the special tool [A].

Special Tools - Piston Ring Compressor Grip: 57001-1095
Piston Ring Compressor Belt, ϕ67 to ϕ79: 57001-1097

- Drive the front chain guide in.
- Install the removed parts.

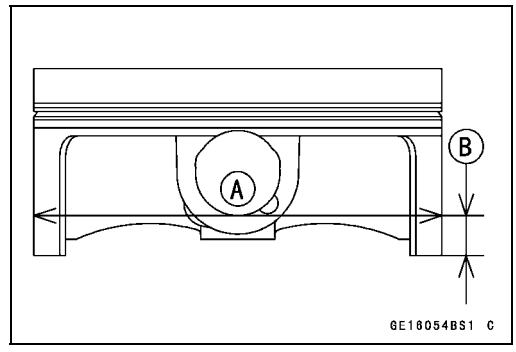
Cylinder Wear Inspection

- Refer to the Cylinder Wear Inspection in the Periodic Maintenance chapter.

Piston Wear Inspection

- Using a micrometer, measure the outside diameter [A] of each piston 10 mm (0.197 in.) [B] up from the bottom of the piston at a right angle to the direction of the piston pin.

★If the pistons outside diameter is smaller than the service limit, replace the piston.



Piston Diameter
Standard: 76.955 ~ 76.970 mm (3.0297 ~ 3.0303 in.)
Service Limit: 76.82 mm (3.0244 in.)

Piston/Cylinder Clearance Inspection

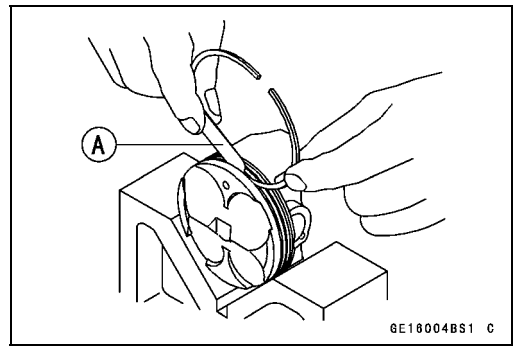
- Refer to the Piston/Cylinder Clearance in the Periodic Maintenance chapter.

Piston Ring/Ring Groove Clearance Inspection

- Check for uneven groove wear by inspecting the ring seating.

★The rings should fit perfectly parallel to groove surfaces. If not, replace the piston and all the piston rings.

- With the piston rings in their grooves, make several measurements with a thickness gauge [A] to determine piston ring/groove clearance.



Piston Ring/Ring Groove Clearance
Standard:
Top 0.04 ~ 0.08 mm (0.0016 ~ 0.0031 in.)
Service Limit:
Top 0.18 mm (0.0071 in.)

★If the piston ring groove clearance is greater than the service limit, measure the ring thickness and groove width as follows to decide whether it is necessary to replace the rings, the piston or both.

Cylinder and Piston

Piston Ring Groove Width Inspection

- Measure the groove width at several points around the piston with a vernier caliper.

Piston Ring Groove Width
Standard:
Top **0.83 ~ 0.85 mm (0.0327 ~ 0.335 in.)**
Service Limit:
Top **0.93 mm (0.0366 in.)**

★If any of the groove widths exceeds the service limit, replace the piston.

Piston Ring Thickness Inspection

- Measure the thickness at several points around ring with a micrometer.

Piston Ring Thickness (Top)
Standard: **0.77 ~ 0.79 mm (0.0303 ~ 0.0311 in.)**
Service Limit: **0.70 mm (0.0276 in.)**

★If any of the measurements is less than the service limit on either of the rings, replace the rings as a set.

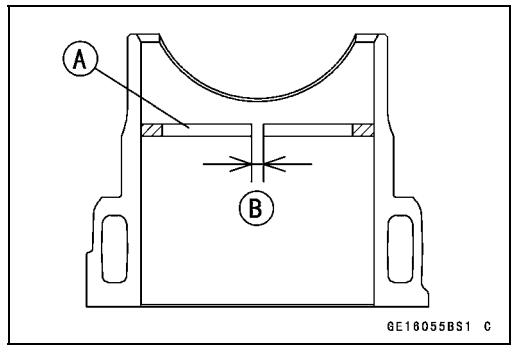
NOTE

○*When using new rings in a used piston, check for uneven groove wear. The rings should fit perfectly parallel to the groove sides. If not, replace the piston.*

Piston Ring End Gap Measurement

- Place the piston ring [A] inside the cylinder, using the piston to locate the ring squarely in place. Place the piston ring close to the bottom of the cylinder, where cylinder wear is minimal
- Measure the gap [B] between the ends of the ring using a thickness gauge.

★If the ring end gap exceeds the service limit, replace the ring.



Piston Ring End Gap
Standard:
Top **0.15 ~ 0.25 mm (0.0059 ~ 0.0098 in.)**
Oil **0.20 ~ 0.70 mm (0.0079 ~ 0.0276 in.)**
Service Limit:
Top **0.55 mm (0.0217 in.)**
Oil **1.0 mm (0.0394 in.)**

Cylinder and Piston

Piston, Piston Pin, Connecting Rod Wear Inspection

- Visually inspect the snap ring [A] still fitted in place.

★If the ring shows weakness or deformation, replace the ring. Also if the pin hole groove shows excessive wear, replace the piston.

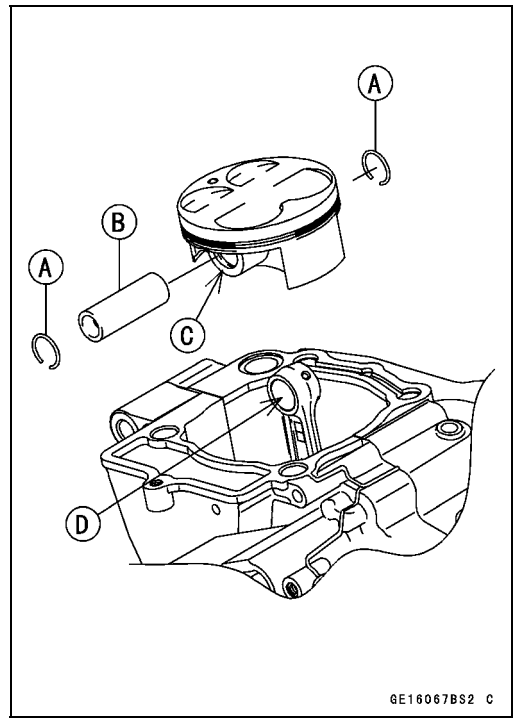
- Measure the diameter of the piston pin [B] with a micrometer.

★If the piston pin diameter is less than the service limit at any point, replace the piston pin.

- Using a cylinder gauge, measure the diameter of both of piston pin holes [C] in the piston and the inside diameter of the connecting rod small end [D].

★If either piston pin hole diameter exceeds the service limit, replace the piston.

★If the connecting rod small end inside diameter exceeds the service limit, replace the connecting rod.



Piston Pin Diameter

Standard: **15.992 ~15.997 mm (0.6296 ~ 0.6298 in.) (KX250T6F)**

15.991 ~16.000 mm (0.6296 ~ 0.6299 in.) (KX250T7F ~)

Service Limit: **15.96 mm (0.628 in.)**

Piston Pin Hole Diameter

Standard: **16.004 ~ 16.010 mm (0.6301 ~ 0.6303 in.)**

Service Limit: **16.07 mm (0.633 in.)**

Small End Inside Diameter

Standard: **16.010 ~ 16.018 mm (0.6303 ~ 0.6306 in.)**

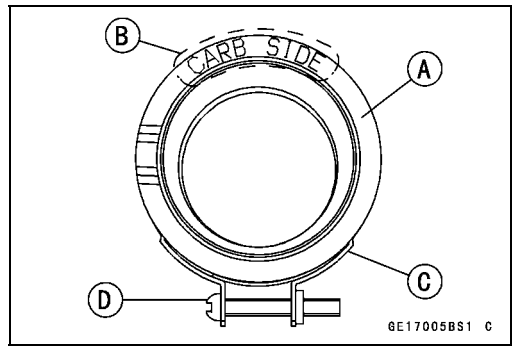
Service Limit: **16.05 mm (0.632 in.)**

Carburetor Holder

Carburetor Holder Installation

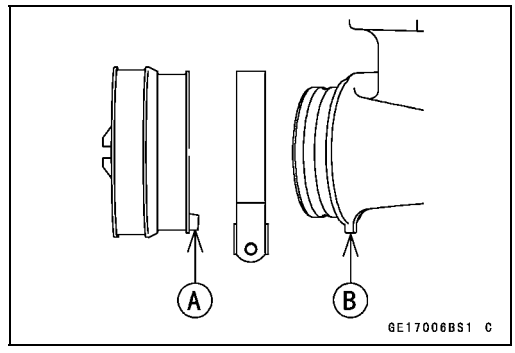
- Install the carburetor holder [A] with the marked [B] side facing toward the cylinder head outside.

○Install the holder clamp [C] with its screw head [D] facing left side.



Torque - Carburetor Holder Clamp Screw: 2.0 N·m (0.2 kgf·m, 17 in·lb)

- Fit the projection [A] of the holder into the recess [B] of the cylinder head.



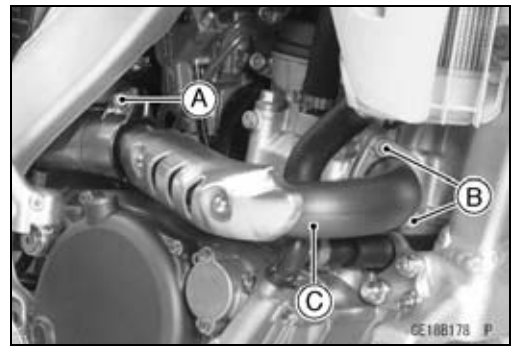
Muffler

⚠ WARNING

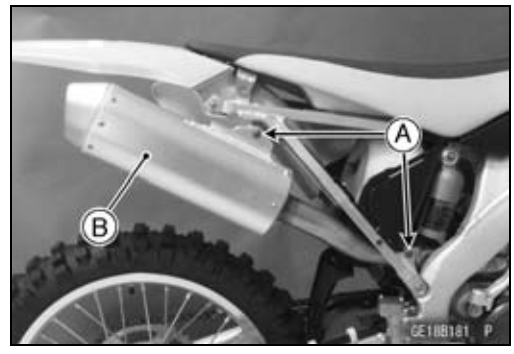
To avoid a serious burn, do not remove the muffler when the engine is still hot. Wait until the muffler cools down.

Muffler Removal

- Loosen the muffler pipe clamp bolt [A].
- Remove the exhaust pipe holder nuts [B].
- Remove the exhaust pipe [C].

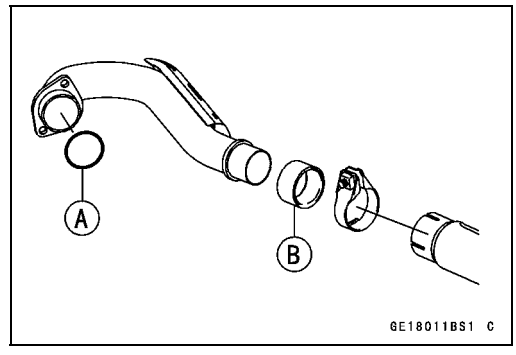


- Remove
  Right Side Cover (see Side Cover Removal in the Frame chapter)
- Remove the muffler mounting bolts [A].
- Remove the muffler body [B] from the back.



Muffler Installation

- Check the exhaust pipe holder gasket [A] and replace it if it is damaged.
- Check the gasket [B] at the clamp and replace it if it is damaged. Make sure that the gasket is placed securely outside the exhaust pipe.



- First tighten all the bolts and nuts to a snug fit.
- Next tighten the exhaust pipe holder nuts evenly to avoid exhaust leaks.
- Lastly, tighten the rest of the bolts and clamp bolt securely.

Torque - Exhaust Pipe Holder Nuts: 21 N·m (2.1 kgf·m, 15 ft·lb)
Muffler Mounting Bolts: 21 N·m (2.1 kgf·m, 15 ft·lb)

- Thoroughly warm up the engine, wait until the engine cools down, and then retighten the exhaust pipe holder nuts, and the clamp bolt securely.

Muffler Baffle Change

- Refer to the Muffler Baffle Change in the Periodic Maintenance chapter.

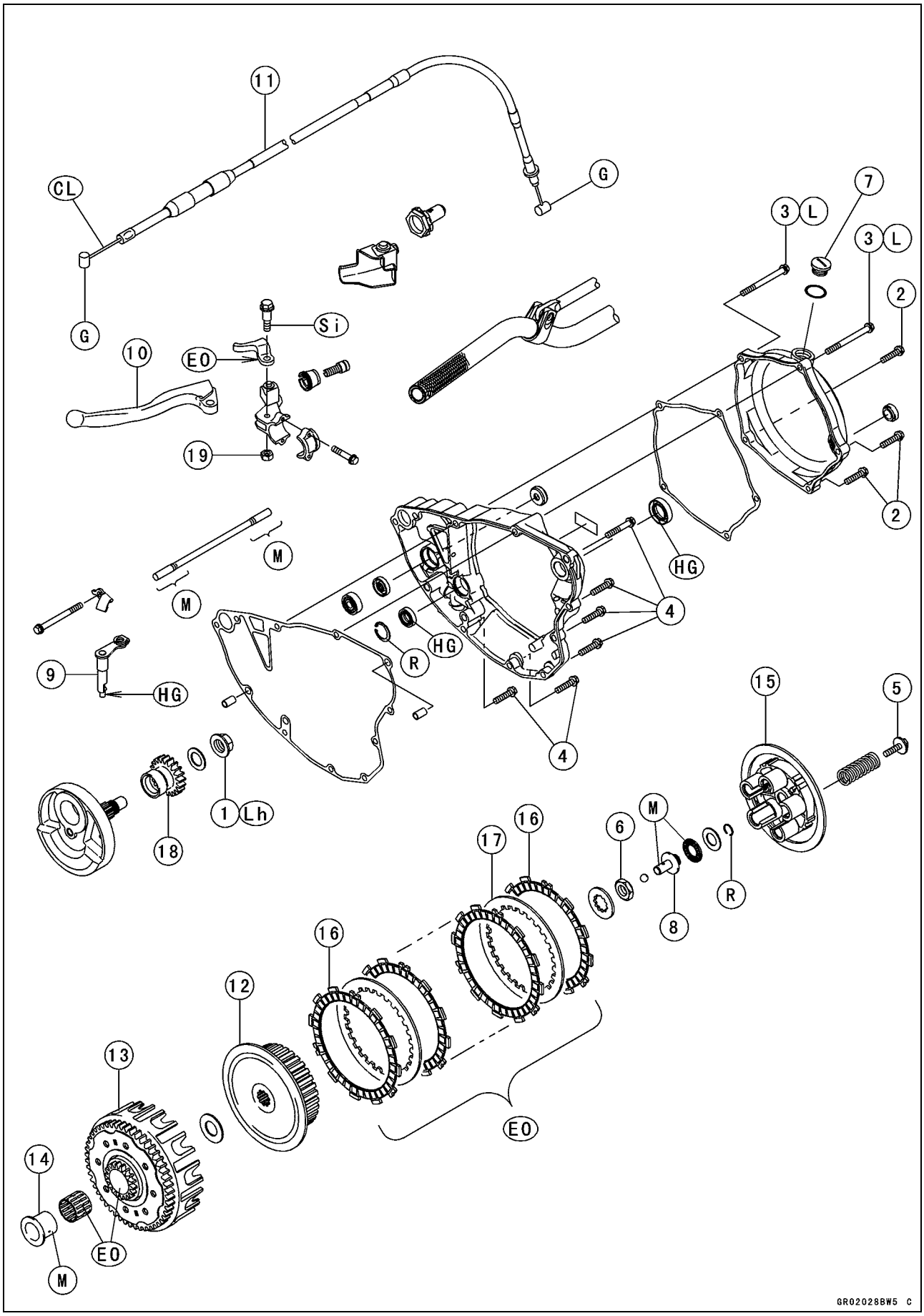
Engine Right Side

Table of Contents

Exploded View 6-2
Specifications 6-6
Special Tools 6-7
Clutch Lever and Cable 6-8
  Clutch Lever (Clutch Cable) Free Play Inspection 6-8
  Clutch Lever (Clutch Cable) Free Play Adjustment 6-8
  Clutch Lever Installation 6-8
  Clutch Cable Removal 6-8
  Clutch Cable Installation 6-9
  Clutch Cable Inspection and Lubrication 6-9
Clutch Cover and Right Engine Cover 6-10
  Clutch Cover Removal 6-10
  Clutch Cover Installation 6-10
  Right Engine Cover Removal 6-10
  Right Engine Cover Installation 6-11
  Release Shaft Removal 6-12
  Release Shaft Installation 6-12
  Oil Seal Installation 6-12
Clutch 6-14
  Clutch Removal 6-14
  Clutch Installation 6-14
  Friction and Steel Plates Wear, Damage Inspection 6-16
  Friction and Steel Plate Warp Inspection 6-16
  Clutch Spring Free Length Inspection 6-17
  Clutch Housing Finger Damage Inspection 6-17
  Friction Plate/Clutch Housing Clearance Inspection 6-17
  Clutch Hub Spline Damage Inspection 6-17
Primary Gear 6-18
  Primary Gear Removal 6-18
  Primary Gear Installation 6-18
External Shift Mechanism 6-19
  External Shift Mechanism Removal 6-19
  External Shift Mechanism Installation 6-19
  External Shift Mechanism Inspection 6-20
Kickstarter 6-22
  Kick Pedal Assy Removal 6-22
  Kick Pedal Assy Installation 6-22
  Kick Pedal Assy Disassembly 6-22
  Kick Pedal Assy Assembly 6-22
  Idle Gear Removal 6-22
  Idle Gear Installation 6-23
  Kickshaft Removal 6-23
  Kickshaft Installation 6-23
  Kickstarter Assembly Disassembly/Assembly 6-24

6-2 ENGINE RIGHT SIDE

Exploded View



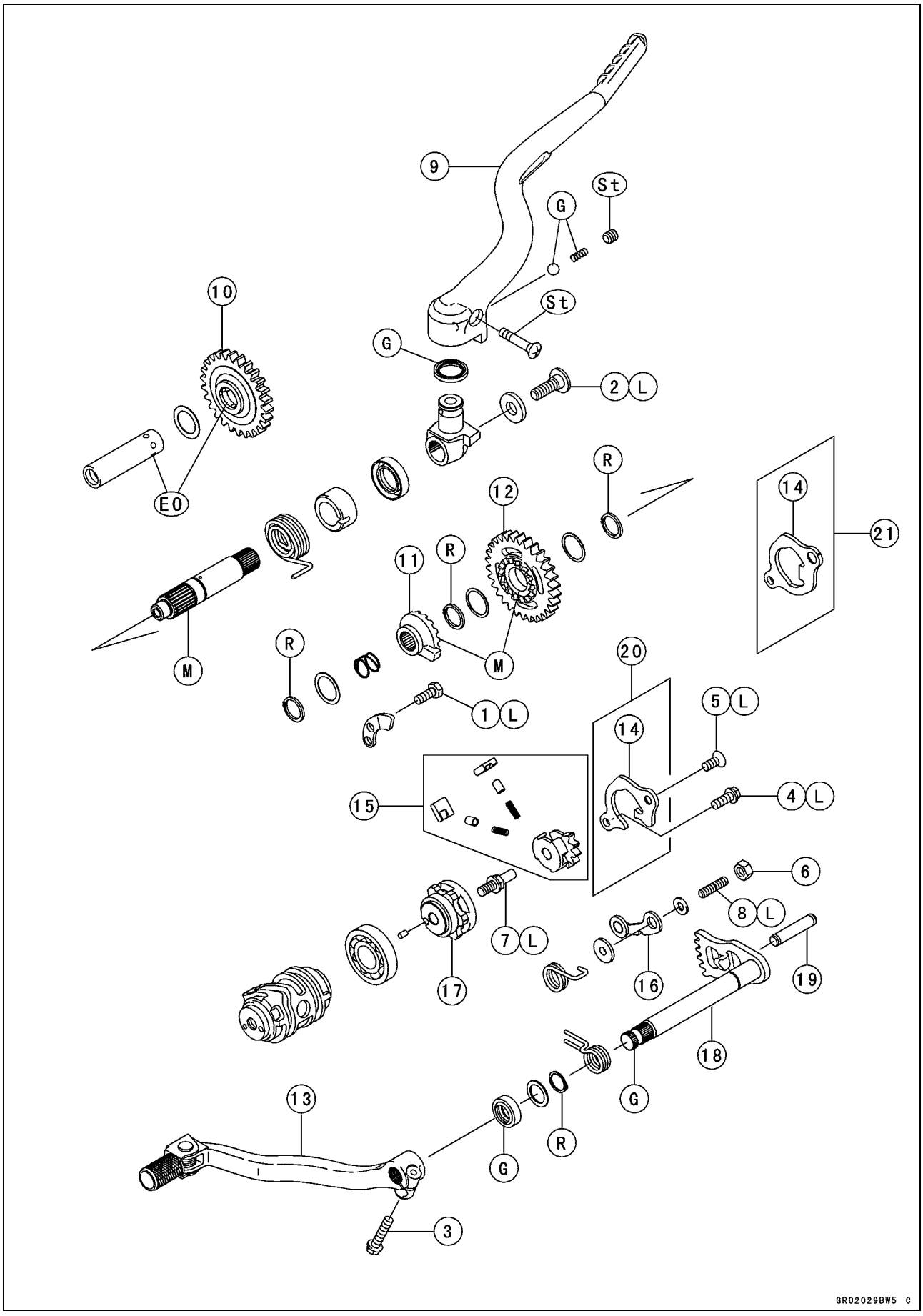
Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Primary Gear Nut	98	10	72	LH
2	Clutch Cover Bolts	9.8	1.0	87 in·lb	
3	Clutch Cover Bolt (with right engine cover)	9.8	1.0	87 in·lb	L (2)
4	Right Engine Cover Bolts	9.8	1.0	87 in·lb	
5	Clutch Spring Bolts	9.8	1.0	87 in·lb	
6	Clutch Hub Nut	98	10	72	
7	Oil Filler Plug	5.0	0.51	44 in·lb	

8. Push Rod Holder
9. Release Lever Shaft
10. Clutch Lever
11. Clutch Cable
12. Clutch Hub
13. Clutch Housing
14. Sleeve
15. Clutch Pressure Plate
16. Friction Plates
17. Steel Plates
18. Primary Gear
19. Clutch Lever Pivot Nut

CL: Apply cable lubricant.
EO: Apply engine oil.
G: Apply grease.
HG: Apply high temperature grease.
L: Apply a non-permanent locking agent.
LH: Left-hand threads
M: Apply molybdenum disulfide grease
R: Replacement Parts
Si: Apply silicone grease.

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Kick Ratchet Guide Bolt	8.8	0.9	78 in·lb	L
2	Kick Pedal Mounting Bolt	25	2.5	18	L
3	Shift Pedal Bolt	9.8	1.0	87 in·lb	
4	Ratchet Plate Mounting Bolt	9.8	1.0	87 in·lb	L
5	Ratchet Plate Mounting Screw (KX250T6F)	6.4	0.65	56 in·lb	L
	Ratchet Plate Mounting Bolt	15	1.5	11	L
6	Gear Set Lever Nut	8.8	0.9	78 in·lb	
7	Shift Drum Cam Bolt	24	2.4	17	L
8	Gear Set Lever Pivot Stud	–	–	–	L

9. Kick Pedal
10. Kickshaft Idle Gear
11. Ratchet Gear
12. Kick Gear
13. Shift Pedal
14. Ratchet Plate
15. Ratchet Assembly
16. Gear Set Lever
17. Shift Drum Cam
18. Shift Shaft
19. Return Spring Pin
20. KX250T6F
21. KX250T7F ~

EO: Apply engine oil.
G: Apply grease.
L: Apply a non-permanent locking agent.
M: Apply molybdenum disulfide grease.
R: Replacement Parts
St: Stake the fasteners.

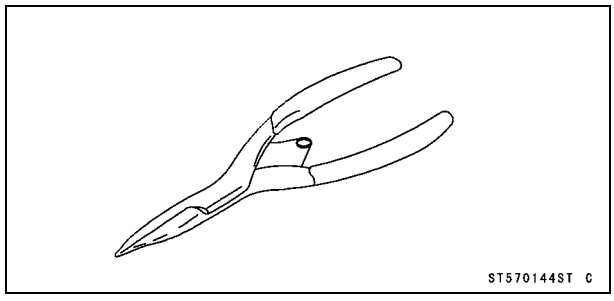
6-6 ENGINE RIGHT SIDE

Specifications

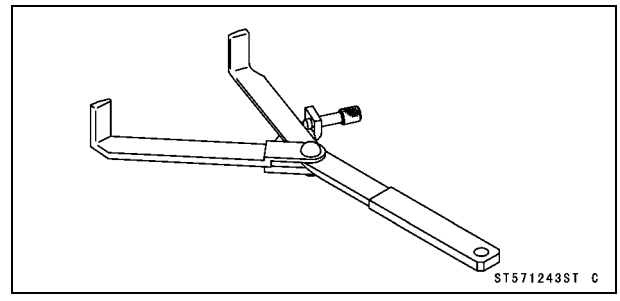
Item	Standard	Service Limit
Clutch Lever		
Clutch Lever Free Play	2 ~ 3 mm (0.08 ~ 0.12 in.)	– – –
Clutch		
Friction Plate Thickness	2.7 ~ 2.9 mm (0.106 ~ 0.114 in.)	2.6 mm (0.102 in.)
Steel Plate Thickness	1.5 ~ 1.7 mm (0.059 ~ 0.067 in.)	1.4 mm (0.055 in.)
Friction Plate Warp	0.15 mm (0.0059 in.) or less	0.3 mm (0.012 in.)
Steel Plate Warp	0.15 mm (0.0059 in.) or less	0.3 mm (0.012 in.)
Clutch Spring Free Length	45.82 mm (1.804 in.)	43.7 mm (1.720 in.)
Friction Plate/Clutch Housing Clearance	0.04 ~ 0.19 mm (0.0016 ~ 0.0075 in.)	0.6 mm (0.024 in.)

Special Tools

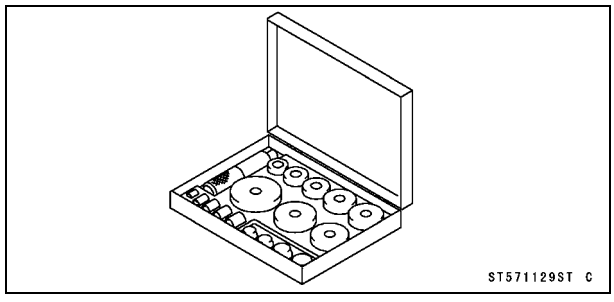
Outside Circlip Pliers:
57001-144



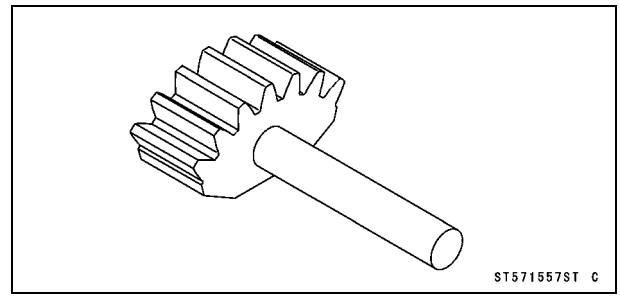
Clutch Holder:
57001-1243



Bearing Driver Set:
57001-1129



Gear Holder, m2.0:
57001-1557



Clutch Lever and Cable

Due to friction plate wear and clutch cable stretch over a long period of use, the clutch must be adjusted in accordance with the Periodic Maintenance Chart.

⚠ WARNING

To avoid a serious burn, never touch the hot engine or exhaust chamber during clutch adjustment.

Clutch Lever (Clutch Cable) Free Play Inspection

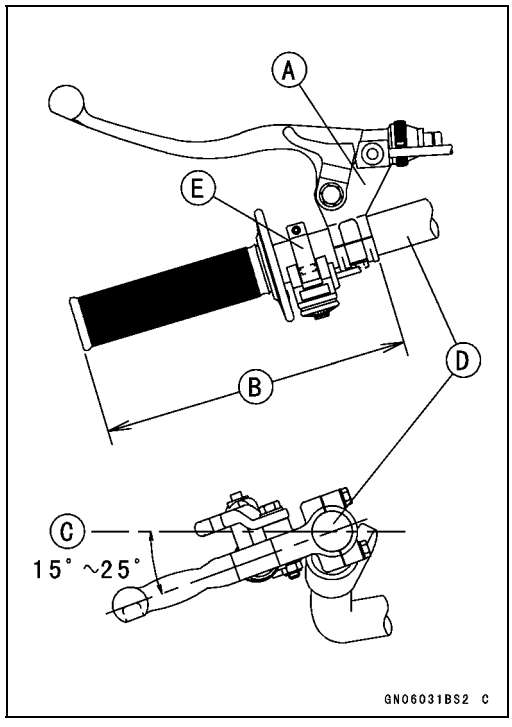
- Refer to the Clutch Lever (Clutch Cable) Free Play Check in the Periodic Maintenance chapter.

Clutch Lever (Clutch Cable) Free Play Adjustment

- Refer to the Clutch Lever (Clutch Cable) Free Play Adjustment in the Periodic Maintenance chapter.

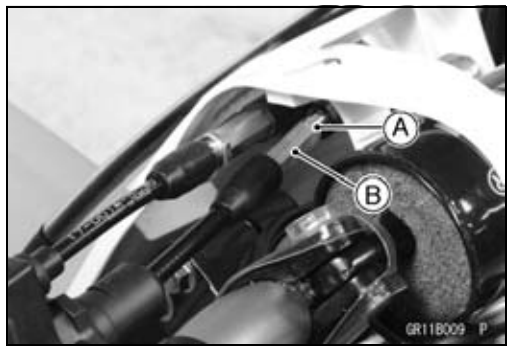
Clutch Lever Installation

- Install the clutch lever holder assembly [A] position as shown in the figure.
  170 mm (6.69 in.) [B]
  Horizontal Line of Frame [C]
  Handlebar [D]
  Engine Stop Switch [E]



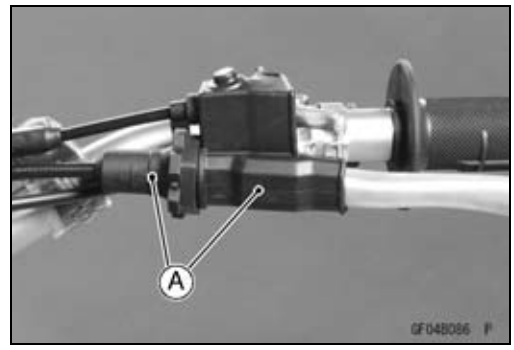
Clutch Cable Removal

- Loosen the locknut [A] fully and screw in the adjuster [B] fully.

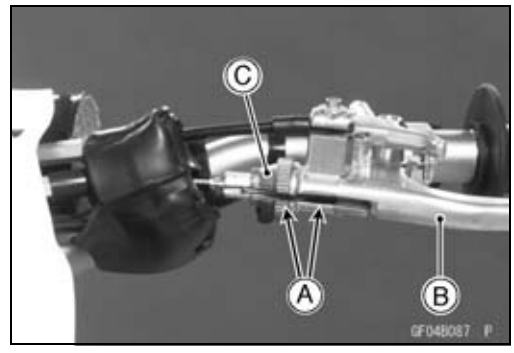


Clutch Lever and Cable

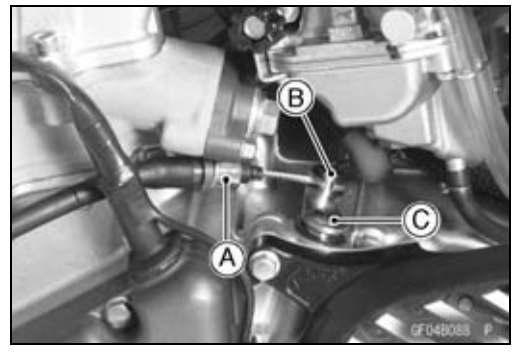
- Slide the dust covers [A] out of place.



- Line up the slots [A] in the clutch lever [B], and adjuster [C] and then free the cable from the lever.



- Free the cable from the cable holder [A].
- Free the clutch inner cable tip [B] from the clutch release lever [C].



CAUTION

Do not remove the clutch release shaft unless it is absolutely necessary. If removed, release shaft oil seal must be replaced with a new one.

- Pull the clutch cable out of the frame.

Clutch Cable Installation

- Run the clutch cable correctly (see Cable, Wire, and Hose Routing section in the Appendix chapter).
- Adjust the clutch cable (see Clutch Lever Free Play Adjustment in the Periodic Maintenance chapter).

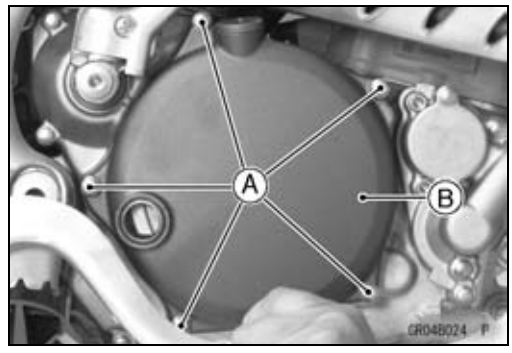
Clutch Cable Inspection and Lubrication

- During a periodic inspection or when the cable has been removed, inspect and lubricate the cable (see General Lubrication in the Periodic Maintenance chapter).

Clutch Cover and Right Engine Cover

Clutch Cover Removal

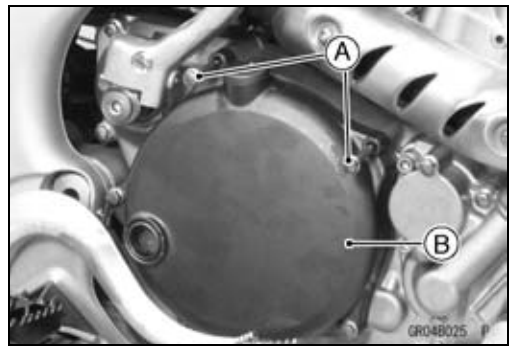
- Drain the engine oil at the transmission oil sump (see Engine Oil Change in the Periodic Maintenance chapter).
- Set the stand attached.
- Remove the clutch cover bolts [A] and remove the clutch cover [B].



Clutch Cover Installation

- Apply a non-permanent locking agent to the two bolts [A] of the clutch cover.
- Install the clutch cover [B].

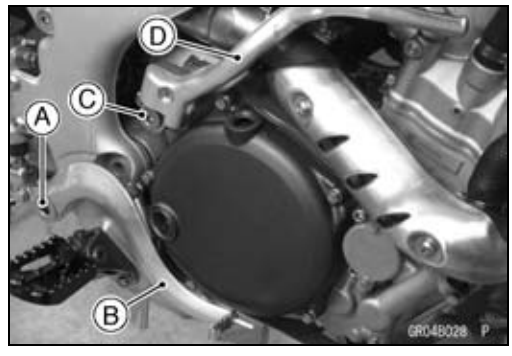
Torque - Clutch Cover Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)



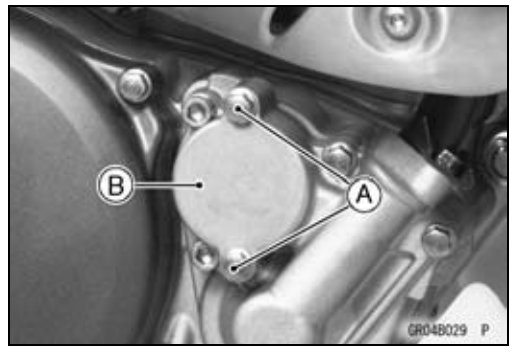
Right Engine Cover Removal

- Drain:
  Engine Oil (see Engine Oil Change in the Periodic Maintenance chapter)
  Coolant (see Coolant Draining in the Cooling System chapter)

- Remove:
  Bolt [A]
  Brake Pedal [B]
  Bolt [C]
  Kick Pedal [D]

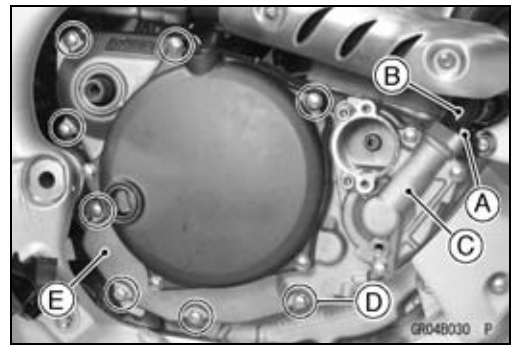


- Remove:
  Oil Filter Cap Bolts [A]
  Oil Filter Cap [B]
  Oil Filter (see Oil Filter Change in the Periodic Maintenance chapter)



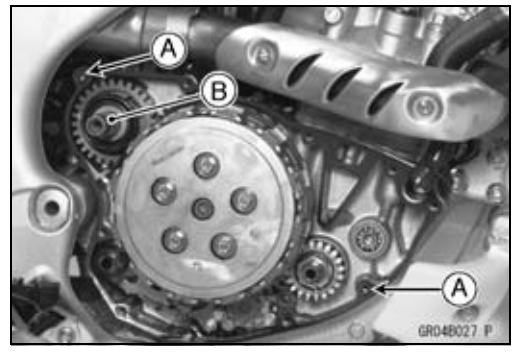
Clutch Cover and Right Engine Cover

- Remove:
  Water Pipe Bolt [A]
  Water Pipe [B]
  Water Pump Cover [C]
- Remove the right engine cover bolts [D] to remove the right engine cover [E].



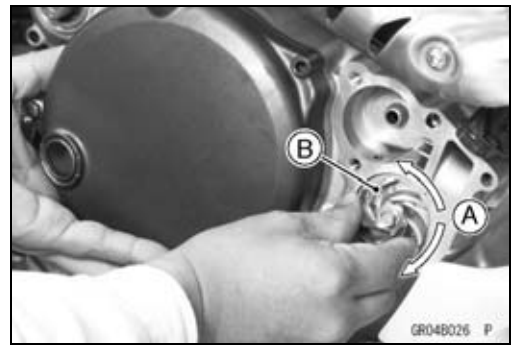
Right Engine Cover Installation

- Two dowel pins [A] are installed at the mating surface between the crankcase and the right engine cover.
- Replace the engine cover gasket with a new one.
- Apply a high-temperature grease to the kick shaft oil seal lips.
- Wrap the spline [B] of the kick shaft with the vinyl tape.



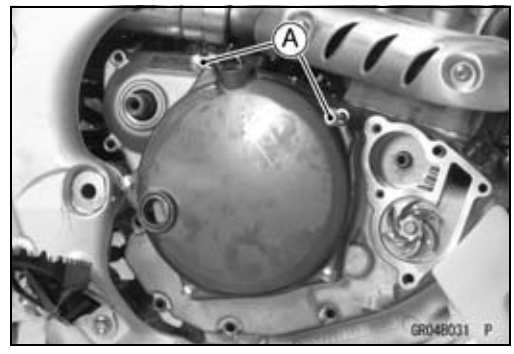
- When installing the cover doesn't go well, the cover is installed according to the following procedures.

○The cover is installed while turning [A] the impeller [B].

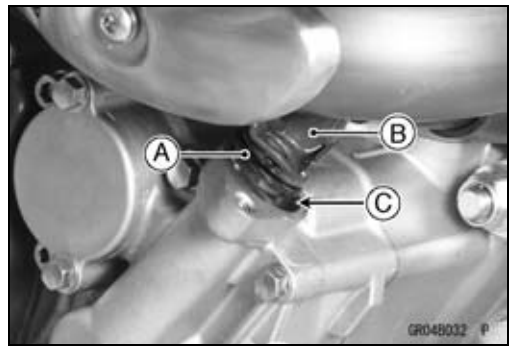


- Apply a non-permanent locking agent to two clutch cover bolts [A].

Torque - Right Engine Cover Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)



Clutch Cover and Right Engine Cover

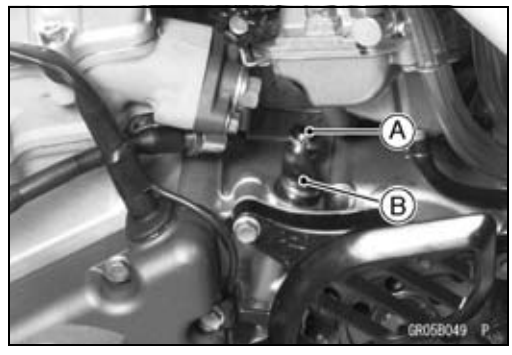


- Install:
  Water Pump Cover (see Water Pump Cover Installation in the Cooling System chapter)
- Apply grease to the water pipe O-ring [A].
- Insert the water pipe [B] straight into the hole [C] of the water pump cover.

Torque - Water Pump Cover Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)
Coolant Drain Bolt: 7.0 N·m (0.7 kgf·m, 61 in·lb)
Water Pipe Bolt: 9.8 N·m (1.0 kgf·m, 87 in·lb)

- Apply grease to the brake pedal bolt and install the brake pedal (see Brake Pedal Installation in the Brakes chapter).
- Remove the vinyl tape wound before to the spline of the kick shaft.
- Install the kick pedal (see Kick Pedal Installation).
- Install the engine oil drain plug surely.
- Pour in the specified type and amount of oil (see Engine Oil Change in the Periodic Maintenance chapter).
- Pour in the specified type and amount of coolant (see Coolant Filling in the Cooling System chapter).
- Check the rear brake (see Brakes section in the Periodic Maintenance chapter).

Release Shaft Removal



- Remove:
  Clutch (see Clutch Removal)
  Clutch Cable Upper End (see Clutch Cable Removal)
- Remove the tips [A] of the clutch cable.
- Pull the lever and shaft assembly [B] out of the crankcase.

Release Shaft Installation

- Apply high-temperature grease to the oil seal lips.
- Apply engine oil to the bearing in the hole of the crankcase.
- Insert the release shaft straight into the upper hole of the crankcase.

CAUTION
When inserting the release shaft, be careful not to remove the spring of the oil seal.

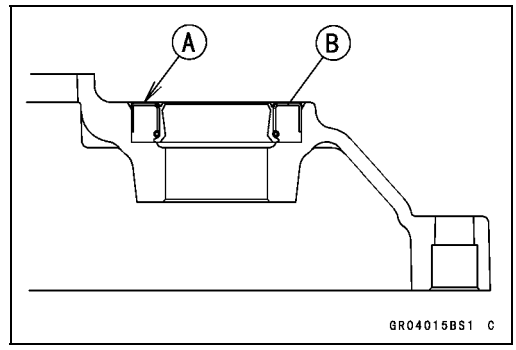
Oil Seal Installation

CAUTION
If the oil seal is removed, replace all of them with new ones at the same time

- Be sure to replace the oil seals.

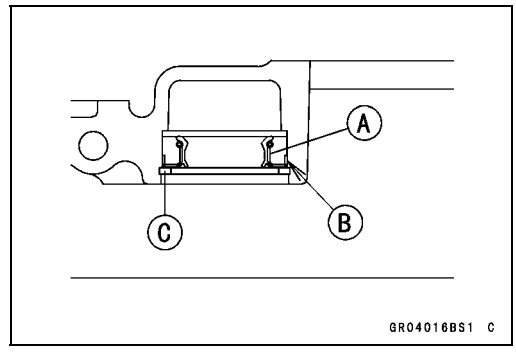
Clutch Cover and Right Engine Cover

● Apply plenty of high temperature grease to the oil seal lips.
● Press in the oil seals direction as shown.
○Press in the new oil seal using a press and suitable tools so that the seal surface is flush with the surface of the right engine cover.
Flat Side [A]
Kickshaft Oil Seal [B]



○Press the new crankshaft oil passage oil seal [A] into the hole until the oil seal is bottomed.
Flat Side [B]
Circlip [C]

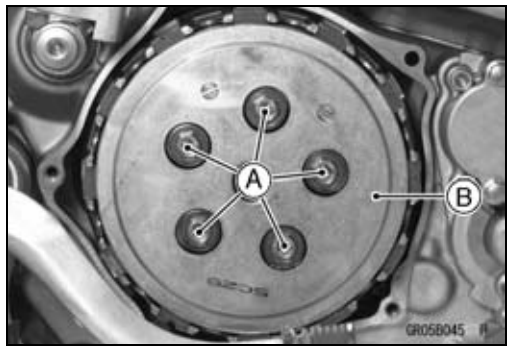
Special Tool - Bearing Driver Set: 57001-1129



Clutch

Clutch Removal

- Drain the engine oil at the transmission oil sump (see Engine Oil Change in the Periodic Maintenance chapter).
- Remove the clutch cover (see Clutch Cover Removal).
- Remove the clutch spring bolts [A], spring, and clutch pressure plate [B].



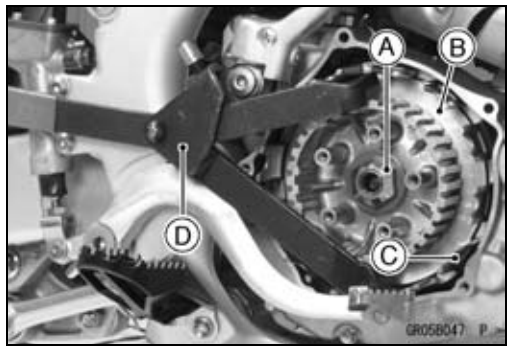
- Remove the push rod holder assy [A], friction plates [B] and steel plates [C].
- Remove steel ball.

- Remove the clutch hub nut [A] and washer.
- Remove the clutch hub [B], thrust washer, and housing [C].

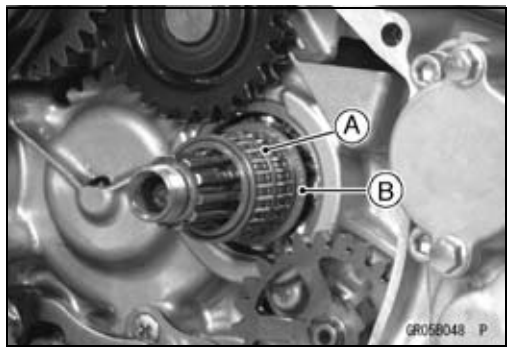
NOTE

○*Use the clutch holder [D] to prevent the clutch hub from rotating.*

Special Tool - Clutch Holder: 57001-1243

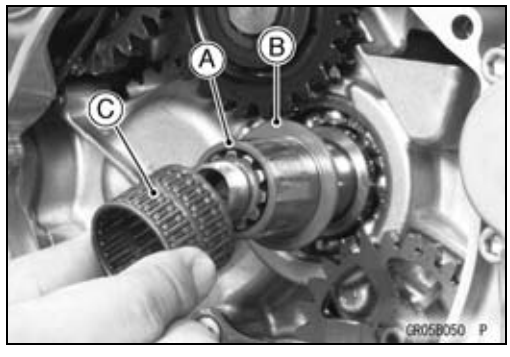


- Remove the needle bearing [A], and sleeve [B].



Clutch Installation

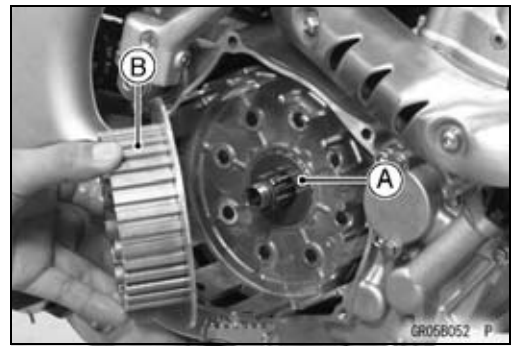
- Apply molybdenum disulfide grease to the outside of the sleeve.
- Apply engine oil to the inside of the clutch housing gear and the needle bearing.
- Install the sleeve [A] so that the stopper side [B] faces inward.
- Install the needle bearing [C].



Clutch

● Install the clutch housing [A].
○Turning the oil pump idle gear with the thin blade screwdriver [B] push in the clutch housing and then install the housing to the kick idle gear.

● Do not forget to install the thrust washer [A] before installing the clutch hub [B].



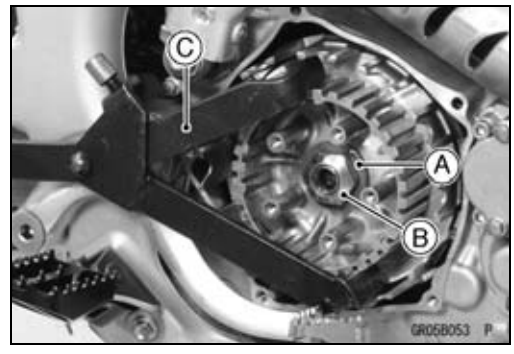
● Install the toothed washer [A].
● Tighten the clutch hub nut [B].

Torque - Clutch Hub Nut: 98 N·m (10 kgf·m, 72 ft·lb)

NOTE

○*Use the clutch holder [C] to prevent the clutch hub from rotating.*

Special Tool - Clutch Holder: 57001-1243

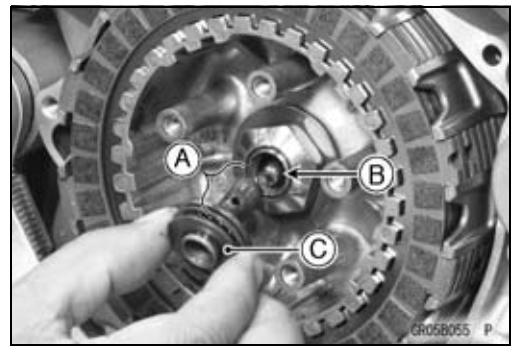


● Install the friction plates and steel plates, starting with a friction plate [A] and alternating them. Finishing with a friction plate.
○Apply engine oil to the new friction plates when it shall be installed.

CAUTION

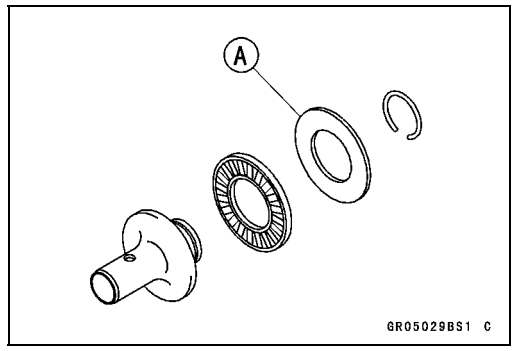
If dry steel plates and friction plates are installed, apply engine oil to the surfaces of each plate to avoid clutch plate seizure.

● Apply molybdenum disulfide grease to the rubbing portion [A] of the push rod holder.
● Install the steel ball [B] and push rod holder assy [C].



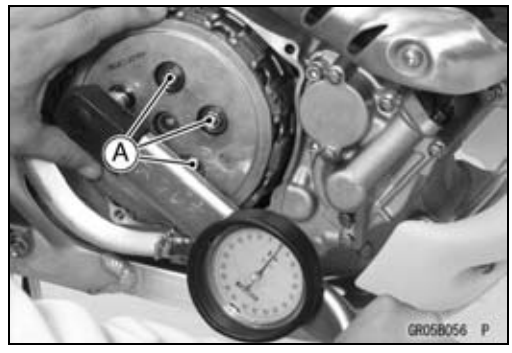
Clutch

● If a clutch part was replaced, install the standard adjusting washer (1.5 mm thickness) [A] of the push rod holder assy, and check the release lever position as explained later procedure.



● Tighten the clutch spring bolts [A] holding the clutch housing with the hand.

Torque - Clutch Spring Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)

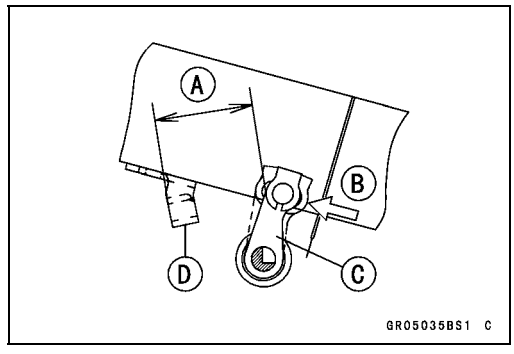


● Check the release shaft lever position.

○Pushing [B] the release shaft lever [C] lightly frontward measure the distance [A] between the lever and cable bracket [D].

Release Shaft Lever Position
Standard: 36.7 ~ 44.5 mm (1.44 ~ 1.75 in.)

★If the lever position is not within the standard, select the correct thickness of adjusting washer(s) according to the tables shown.



Adjusting Washers

Thickness	Part Number
1.5 mm (0.06 in.)	92200-1548
1.0 mm (0.04 in.)	92200-0045

Release Shaft Lever Position and Adjusting Washer Selection

Position Distance	Judgment	Washers Thickness	Qty
36.7 mm to 44.5 mm (1.44 ~ 1.75 in.)	Standard	1.5 mm (0.06 in.)	1
More than 44.5 mm (1.75 in.)	Too big	1.0 mm (0.04 in.)	1
Less than 36.7 mm (1.44 in.)	Too small	1.0 mm (0.04 in.)	2

★Remove the push rod holder assy as necessary and reinstall the clutch.

Friction and Steel Plates Wear, Damage Inspection

● Refer to the Friction and Steel Plates Inspection in the Periodic Maintenance chapter.

Friction and Steel Plate Warp Inspection

● Refer to the Friction and Steel Plate Inspection in the Periodic Maintenance chapter.

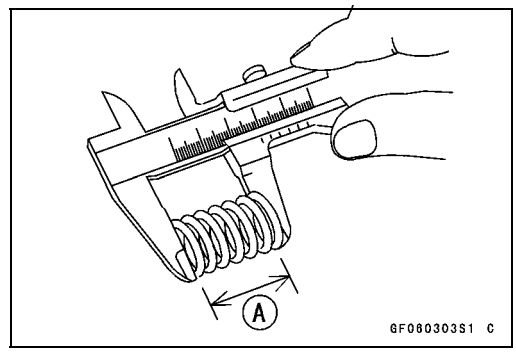
Clutch

Clutch Spring Free Length Inspection

- Measure the free length [A] of the clutch springs.

★If any clutch spring is shorter than the service limit, it must be replaced.

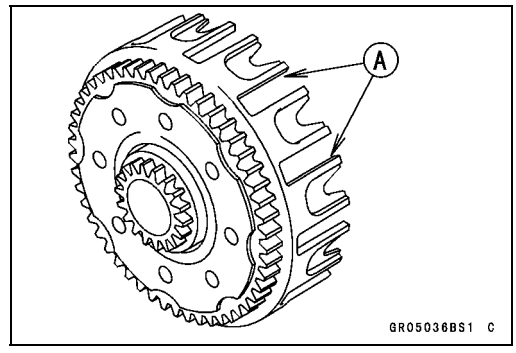
Clutch Spring Free Length
Standard: 45.82 mm (1.804 in.)
Service Limit: 43.7 mm (1.720 in.)



Clutch Housing Finger Damage Inspection

- Visually inspect the clutch housing fingers [A] that come in contact with the friction plate tangs.

★If they are damaged or if there are groove cuts in the areas that come in contact with the tangs, replace the housing. Replace the friction plates if their tangs are damaged as well.



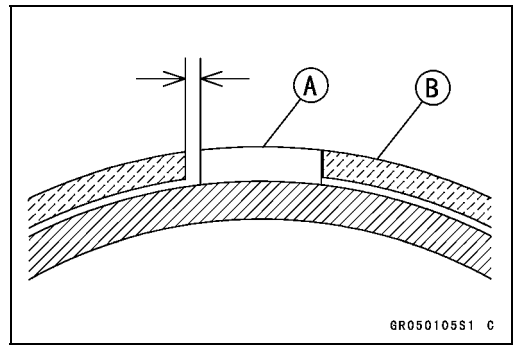
Friction Plate/Clutch Housing Clearance Inspection

- Measure the clearance between the tangs [A] on the friction plate and the fingers [B] of the clutch housing.

★If this clearance is excessive, the clutch will be noisy.

★If the clearance exceeds the service limit, replace the friction plates.

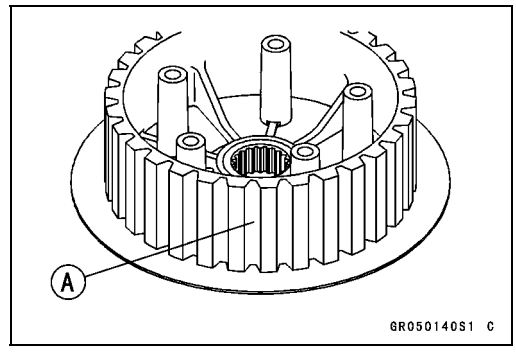
Friction Plate/Clutch Housing Clearance
Standard: 0.04 ~ 0.19 mm (0.0016 ~ 0.0075 in.)
Service Limit: 0.6 mm (0.024 in.)



Clutch Hub Spline Damage Inspection

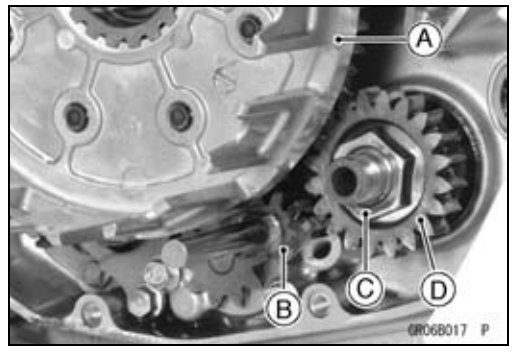
- Visually inspect the areas of the clutch hub splines that come in contact with the teeth of the steel plates.

★If there are notches worn into the clutch hub splines [A], replace the clutch hub. Replace the steel plates if their teeth are damaged as well.



Primary Gear

Primary Gear Removal



- Remove:
  Right Engine Cover (see Right Engine Cover Removal)
  Clutch (see Clutch Removal)
- Temporarily install the clutch housing [A].
- Using the gear holder [B], secure the primary gear.

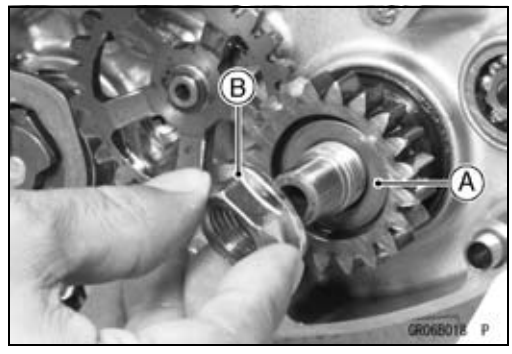
Special Tool - Gear Holder, m2.0: 57001-1557

- Remove the primary gear nut [C], washer, and the primary gear [D].

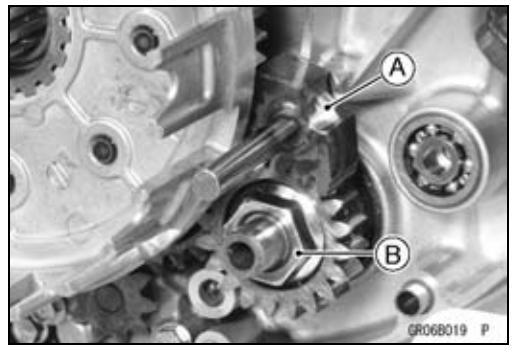
○Primary gear nut is left-hand threads.

- Remove the clutch housing.

Primary Gear Installation



- Apply high-temperature grease to the oil seal lip.
- Insert the primary gear to the crankshaft.
- Install:
  Washer [A]
  Primary Gear Nut [B]



- Temporarily install the clutch housing.
- Using the gear holder [A], secure the clutch gear and the bottom of the primary gear; then, tighten the primary gear nut [B].

○Primary gear nut is left-hand threads.

Torque - Primary Gear Nut: 98 N·m (10 kgf·m, 72 ft·lb)

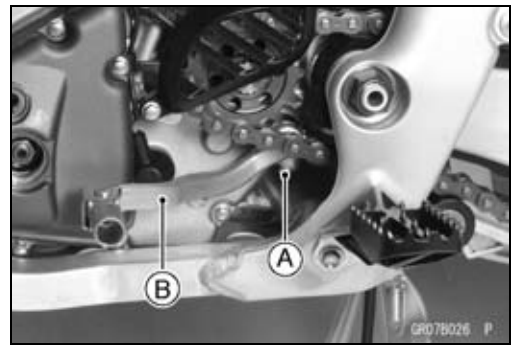
Special Tool - Gear Holder, m2.0: 57001-1557

- Install:
  Clutch (see Clutch Installation)

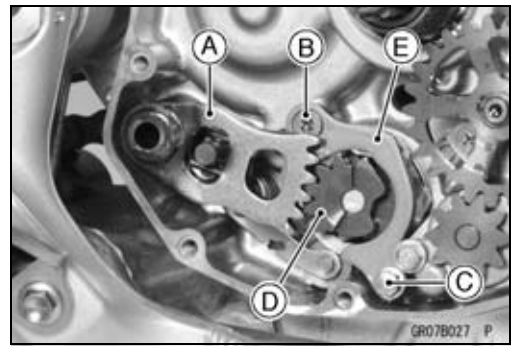
External Shift Mechanism

External Shift Mechanism Removal

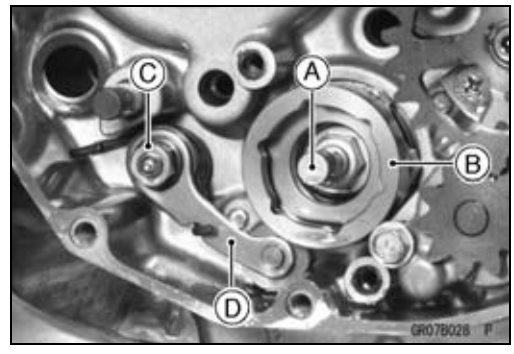
● Remove:
Shift Pedal Bolt [A]
Shift Pedal [B]



● Remove:
Right Engine Cover (see Right Engine Cover Removal)
Clutch Housing (see Clutch Removal)
● Pull out the shift shaft [A].
● Remove the screw [B] and bolt [C], take off the shift ratchet assembly [D] with ratchet plate [E].



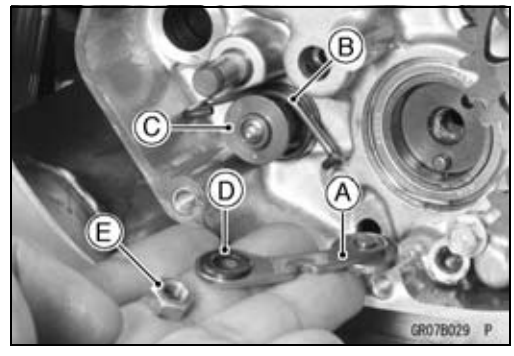
● Remove the bolt [A] and shift dram cam [B].
● Remove the nut [C], and take off the gear set lever [D].



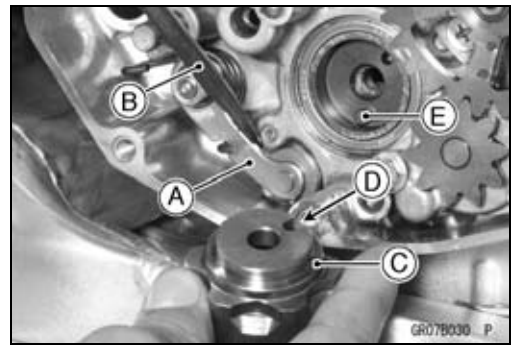
External Shift Mechanism Installation

● Install the gear set lever [A].
○Fit each end of the spring [B] or original positions.
○Do not forget to install the color [C] and washer [D].
● Tighten the gear set lever nut [E].

Torque - Gear Set Lever Nut: 8.8 N·m (0.9 kgf·m, 78 in·lb)

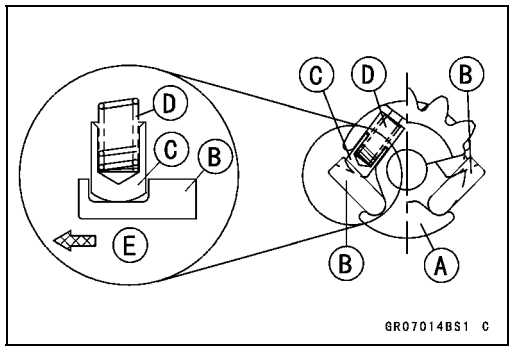


● Holding the gear set lever [A] with the blade screwdriver [B] and install the shift dram cam [C].
○Apply a non-permanent locking agent to the shift dram cam bolt.
○Fit the groove [D] on the pin [E].
● Align the roller of the gear set lever with the slot of the shift dram cam.



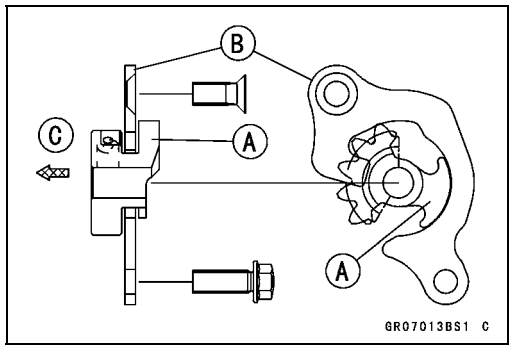
External Shift Mechanism

- Set up the shift ratchet assembly as shown in the figure.
  Ratchet [A]
  Pawls [B]
  Pins [C]
  Springs [D]
  Crankcase Side [E]



- Then install the ratchet assembly [A] to the ratchet plate [B] as shown in the figure.
  Crankcase Side [C]
- Install the ratchet assembly to the shift drum cam.
- Apply a non-permanent locking agent to the bolt and screw.
- Tighten:

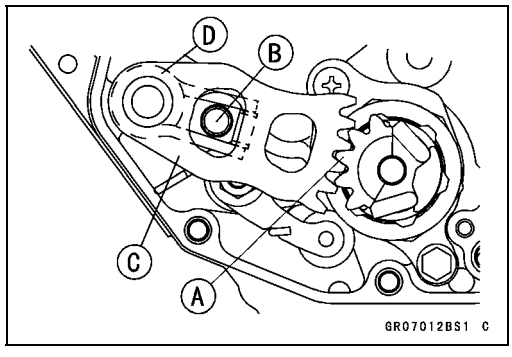
Torque - Ratchet Plate Mounting Bolt: 9.8 N·m (1.0 kgf·m, 87 in·lb)
Ratchet Plate Mounting Screw (KX250T6F): 6.4 N·m (0.65 kgf·m, 56 in·lb)
Ratchet Plate Mounting Bolt: 15 N·m (1.5 kgf·m, 11 ft·lb)



- Align the middle tooth [A] of the ratchet gear with the pin [B].
- Before installing the shift shaft, apply high temperature grease to the oil seal lips and shift shaft splines.
- Insert the shift shaft [C].

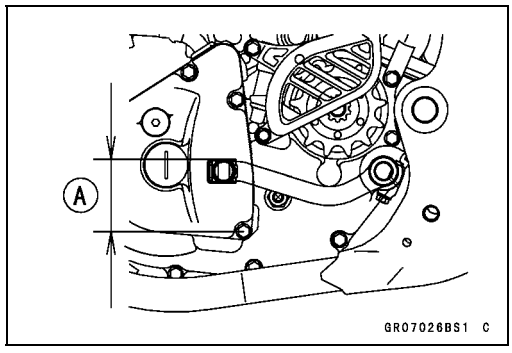
○Be sure to install the washer [D].

- Install:
  Clutch (see Clutch Removal)
  Right Engine Cover (see Right Engine Cover Removal)



- Install the shift pedal as shown.
  50.5 mm (1.988 in.) [A] (KX250T6F ~ T7F)
  45.0 mm (1.772 in.) [A] (KX250T8F)
- Tighten:

Torque - Shift Pedal Bolt: 9.8 N·m (1.0 kgf·m, 87 in·lb)



External Shift Mechanism Inspection

- Check the shift shaft [A] for bending or damage to the splines.

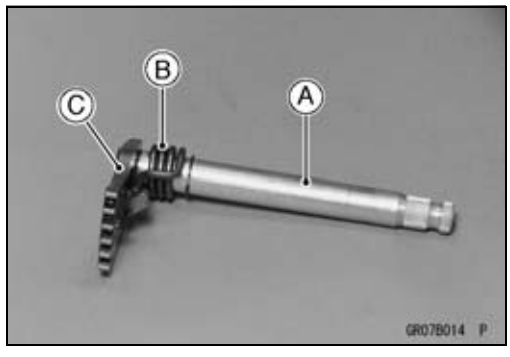
★If the shaft is bent, straighten or replace it. If the splines are damaged, replace the shift shaft.

- Check the return spring [B] for cracks or distortion.

★If the spring is damaged in any way, replace it.

- Check the shift lever [C] for distortion.

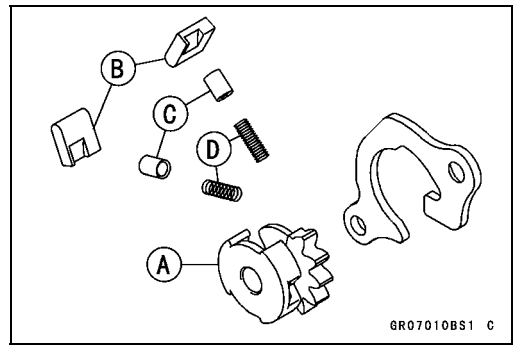
★If the shift lever is damaged in any way, replace the shift shaft.



External Shift Mechanism

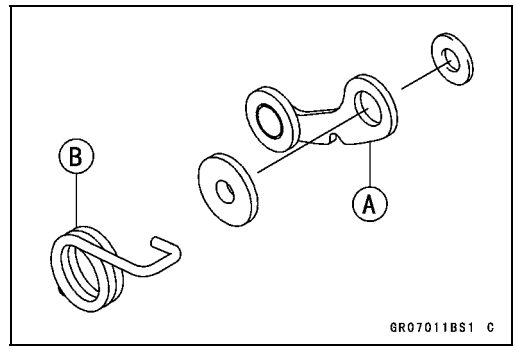
- Check the ratchet assembly for damage.

★If ratchet [A], pawls [B], pins [C] or springs [D] are damaged in any way, replace them.



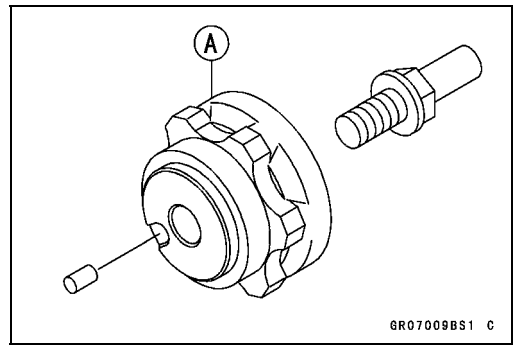
- Check the gear set lever [A] and its spring [B] for cracks or distortion.

★If the lever or spring is damaged in any way, replace them.



- Visually inspect the shift drum cam [A].

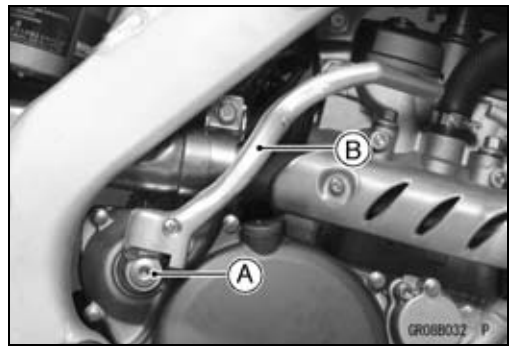
★If it is badly worn or if it shows any damage, replace it.



Kickstarter

Kick Pedal Assy Removal

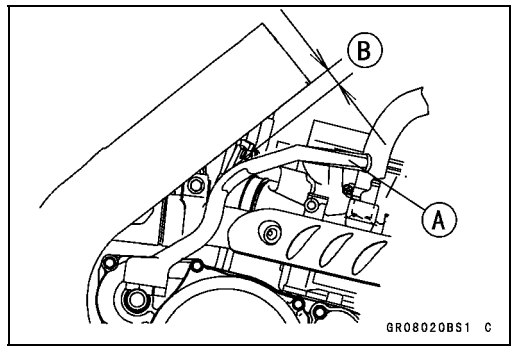
- Remove:
  Mounting Bolt [A]
  Kick Pedal Assy [B]



Kick Pedal Assy Installation

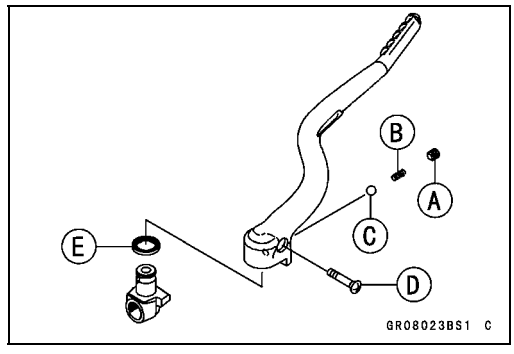
- Install the kick pedal assy [A] at the angle shown.
  10 ~ 20 mm (0.39 ~ 0.79 in.) [B]
- Apply a non-permanent locking agent to the mounting bolt.
- Tighten the mounting bolt.

Torque - Kick Pedal Mounting bolt: 25 N·m (2.5 kgf·m, 18 ft·lb)



Kick Pedal Assy Disassembly

- Remove the kick pedal assy.
- Remove:
  Plug Screw [A]
  Spring [B]
  Steel Ball [C]
  Detent Screw [D]
  Oil Seal [E]

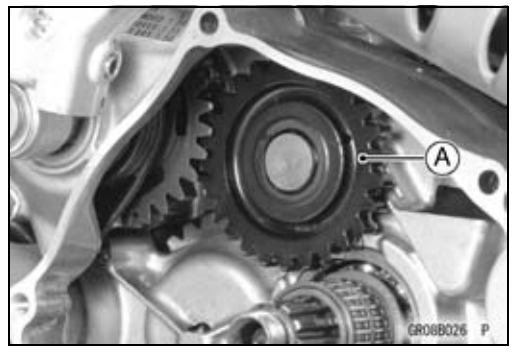


Kick Pedal Assy Assembly

- Apply high-temperature grease to the steel ball, oil seal lip, spring, and the sliding portion of the lever.
- After tightening the screws stake it with a punch.

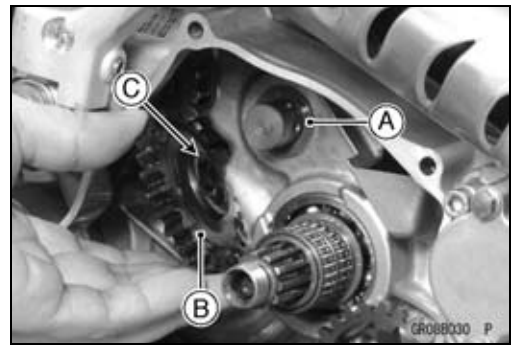
Idle Gear Removal

- Remove:
  Clutch Cover (see Clutch Cover Removal)
  Clutch Housing (see Clutch Removal)
- Pull off the idle gear [A].



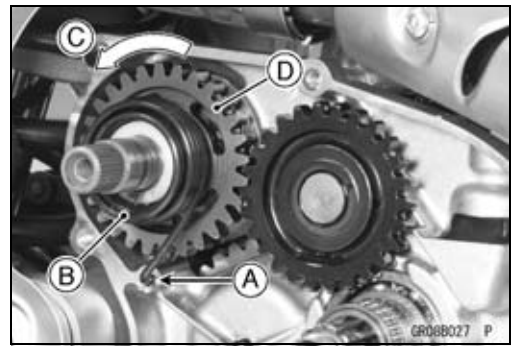
Kickstarter

Idle Gear Installation

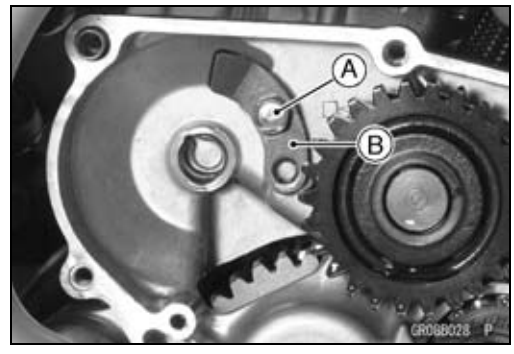


- Apply engine oil to the inside of the idle gear.
- Install the washer [A].
- Fit the idle gear [B] with the boss [C] facing toward the engine side.

Kickshaft Removal

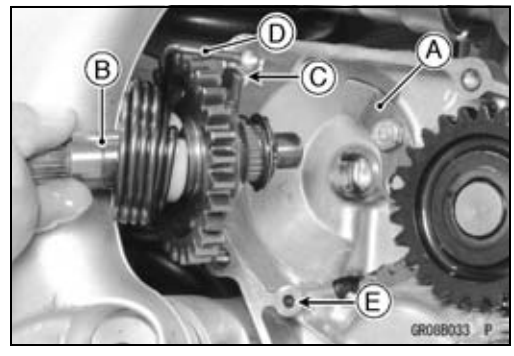


- Remove:
  Right Engine Cover (see Right Engine Cover Removal)
  Clutch Housing (see Clutch Removal)
- Pull the end [A] of the kick spring [B] out of the hole in the crankcase.
- Turn the kickshaft counterclockwise [C] and pull out the kickstarter assembly [D].



- Remove the bolts [A], take off the ratchet guide [B].

Kickshaft Installation



- Apply a non-permanent locking agent to the ratchet guide bolt.
- Install the ratchet guide [A].

  Torque - Kick Ratchet Guide Bolt: 8.8 N·m (0.9 kgf·m, 78 in·lb)

- Apply molybdenum disulfide grease to the end of the kickshaft.
- Insert the kick shaft assembly [B] into the crankcase.

○Securely engage the stopper portion [C] of the ratchet gear with the guide.

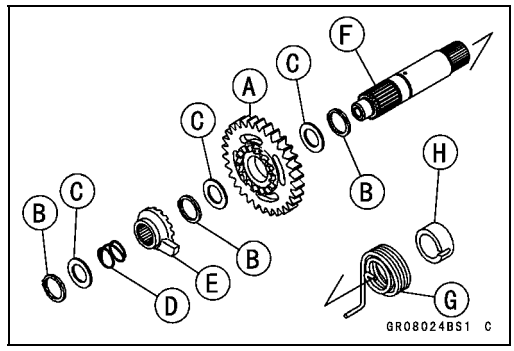
- Insert the spring end [D] into the hole [E].
- Install:
  Clutch Housing (see Clutch Installation)
  Right Engine Cover (see Right Engine Cover Installation)

Kickstarter

Kickstarter Assembly Disassembly/Assembly

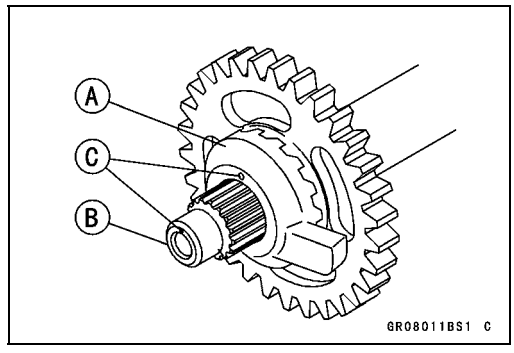
- The kickstarter assembly consists of the following parts.
- Check the kickstarter assembly parts for damage. Any damaged parts should be replaced with new ones.

A. Kick Gear
B. Circlips
C. Washers
D. Spring
E. Ratchet Gear
F. Kick Shaft
G. Kick Spring
H. Spring Guide



- Apply molybdenum disulfide grease to the inside of the kick gear and ratchet gear.
- When assembling the ratchet gear [A] onto the kick shaft [B], align the punch mark [C] on the ratchet gear with the punch mark [C] on the kick shaft.
- Replace the circlips that were removed with new ones.

Special Tool - Outside Circlip Pliers: 57001-144

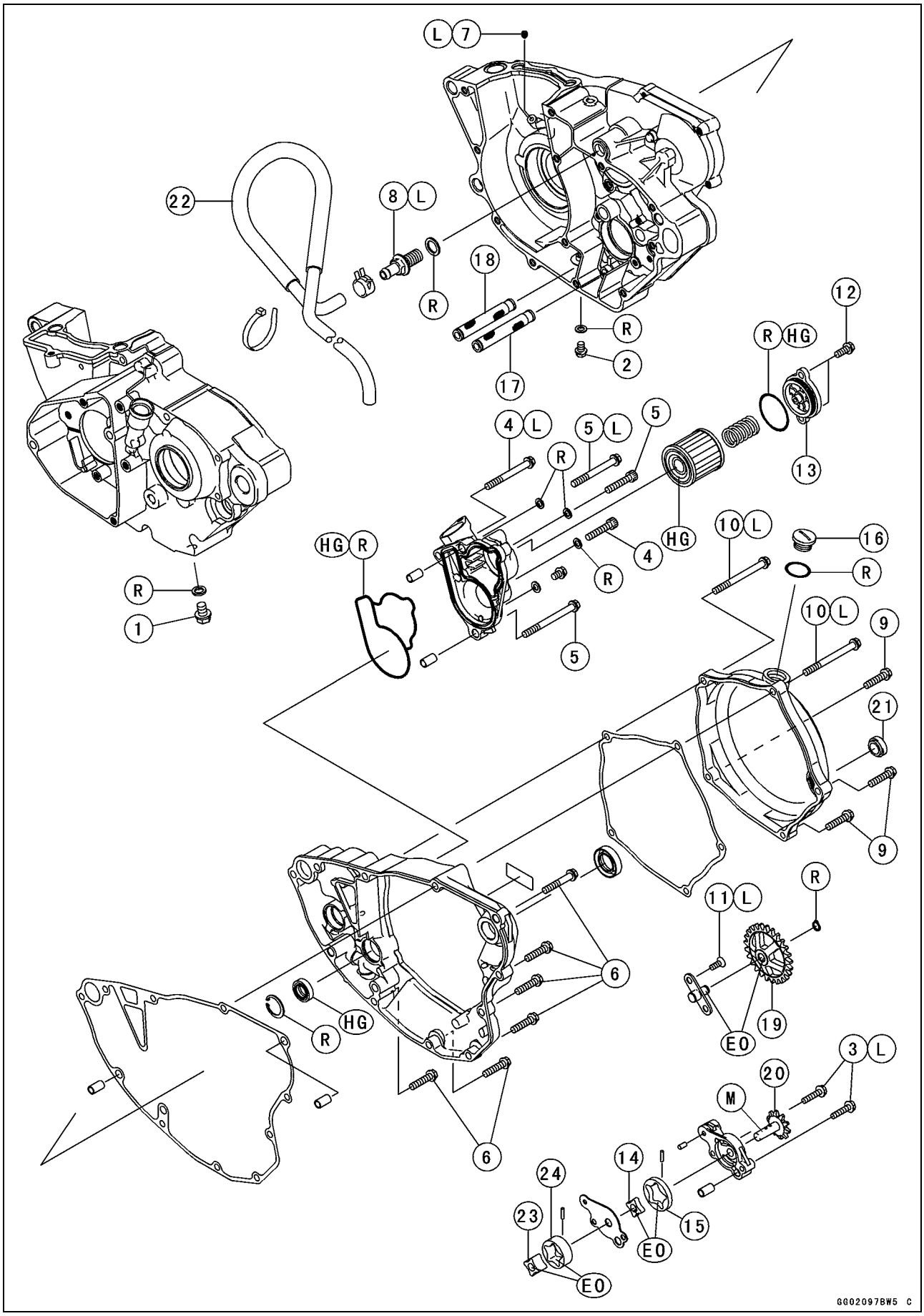


Engine Lubrication System

Table of Contents

Exploded View 7-2
Lubrication System Chart 7-4
Specifications 7-6
Special Tools 7-7
Engine Oil and Oil Filter 7-8
    Engine Oil Level Inspection 7-8
    Engine Oil Change 7-8
    Oil Filter Change 7-9
    Oil Screen Cleaning 7-9
Oil Pump 7-10
    Oil Pump Removal 7-10
    Oil Pump Installation 7-11
    Oil Pump Inspection 7-12
Oil Pressure 7-13
    Oil Pressure Measurement 7-13

Exploded View



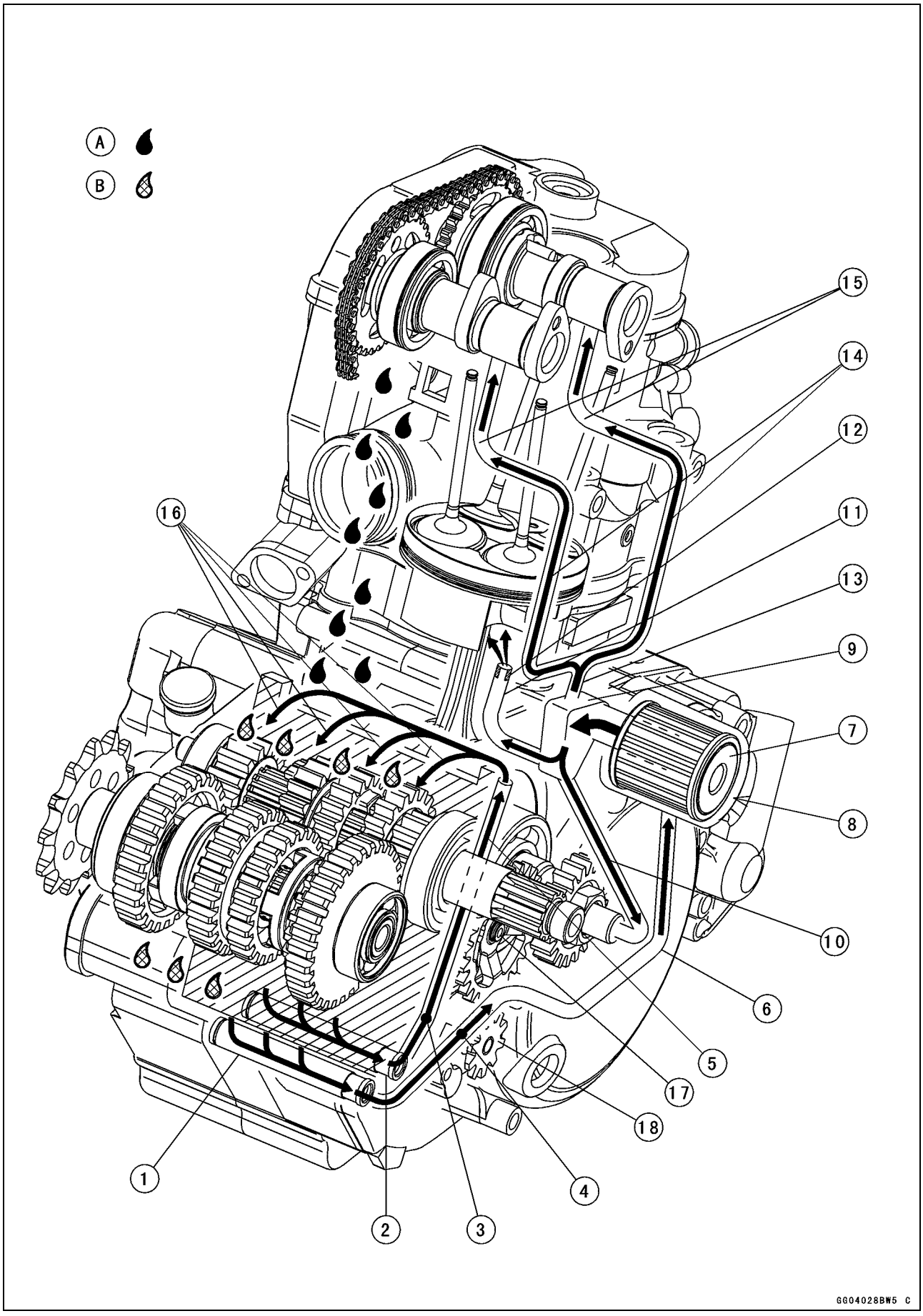
Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Engine Oil Drain Plug M10 (for transmission room oil sump)	20	2.0	14.5	
2	Engine Oil Drain Bolt M6 (for crank room oil sump)	7.0	0.7	61 in·lb	
3	Oil Pump Mounting Bolts	7.0	0.7	61 in·lb	L
4	Water Pump Cover Bolts	9.8	1.0	87 in·lb	L (1)
5	Water Pump Cover Bolt (with washer)	9.8	1.0	87 in·lb	L (1)
6	Right Engine Cover Bolts	9.8	1.0	87 in·lb	
7	Piston Oil Nozzle	2.9	0.29	26 in·lb	
8	Breather Fitting	15	1.5	11	L
9	Clutch Cover Bolts	9.8	1.0	87 in·lb	
10	Clutch Cover Bolt (with right engine cover)	9.8	1.0	87 in·lb	L (2)
11	Oil Pump Idle Gear Shaft Screws	6.4	0.65	56 in·lb	L
12	Oil Filter Cap Bolts	9.8	1.0	87 in·lb	

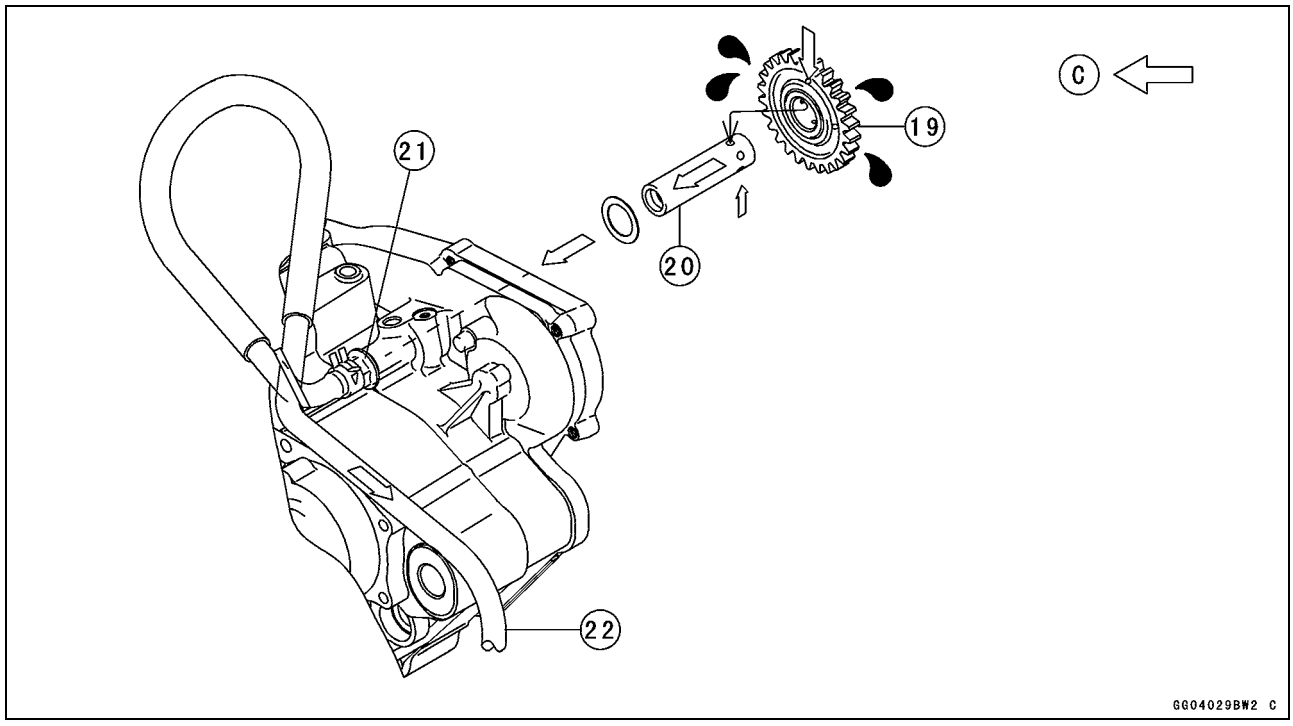
13. Oil Filter Cap
14. Inner Rotor (feed)
15. Outer Rotor (feed)
16. Oil Filler Plug
17. Oil Screen (Transmission Room Oil Sump)
18. Oil Screen (Crank Room Oil Sump)
19. Oil Pump Idle Gear
20. Oil Pump Gear
21. Oil Level Gauge
22. Breather Hose
23. Inner Rotor (Scavenge)
24. Outer Rotor (Scavenge)

EO: Apply engine oil.
HG: Apply high-temperature grease.
L: Apply a non-permanent locking agent.
M: Apply molybdenum disulfide grease.
R: Replacement Parts

Lubrication System Chart



Lubrication System Chart



1. Oil Screen (scavenge)
2. Oil Screen (feed)
3. Oil Pump (scavenge)
4. Oil Pump (feed)
5. Right Crankcase Oil Passage (from Scavenge Oil Pump to Transmission Oil Shower Passage)
6. Right Engine Cover Oil Passage (from Feed Oil Pump to Oil Filter Oil Chamber)
7. Oil Filter
8. Oil Filter Oil Chamber
9. Oil Chamber
10. Right Engine Cover Oil Passage (from Oil Chamber to Crankshaft)
11. Crankcase Oil Passage (from Oil Chamber to Piston Oil Nozzle)
12. Piston Oil Nozzle
13. Crankcase Oil Passage (from Oil Chamber to Cylinder Oil Passage)
14. Cylinder Oil Passage (from Crankcase Oil Passage to Cylinder Head Oil Passage)
15. Cylinder Head Oil Passage (from Cylinder Oil Passage to Camshaft)
16. Oil Shower to Transmission
17. Oil Pump Idle Gear Shaft
18. Oil Pump Gear
19. Kick Starter Idle Gear
20. Kick Starter Idle Gear Shaft
21. Fitting
22. Breather Hose

A: Crank Room Oil
B: Transmission Room Oil
C: Blowby Gas

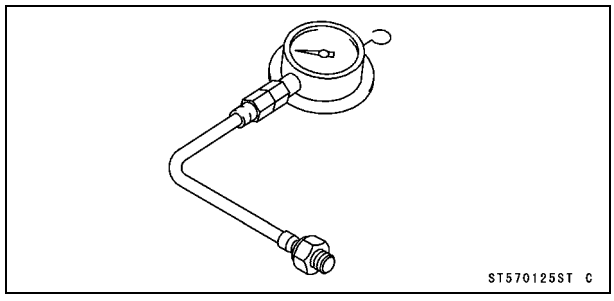
7-6 ENGINE LUBRICATION SYSTEM

Specifications

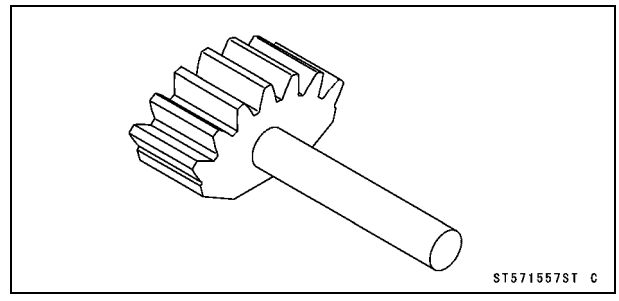
Item	Standard
Engine Oil	
Grade	Castrol “R4 Superbike” 5W-40 (KX250T6F ~ T7F), Castrol “POWER1 R4 Racing” 5W-40 (KX250T8F) or API SG, SH, SJ or SL with JASO MA
Viscosity	SAE 10W-30, 10W-40, or 10W-50
Capacity	
Oil Change - when filter is not removed	1.3 L (1.4 US qt)
Oil Change - when filter is removed	1.35 L (1.43 US qt)
when engine is completely dry	1.5 L (1.6 US qt)
Oil Level (after warm-up or driving)	Upper level
Oil Pressure	
(oil temperature 90°C, engine speed 4 000 rpm)	19.6 kPa (0.2 kgf/cm², 2.8 psi)

Special Tools

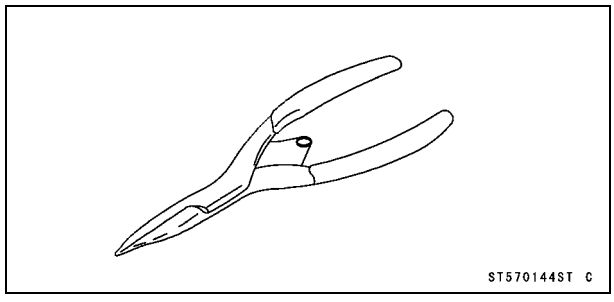
Oil Pressure Gauge, 5 kgf/cm²:
57001-125



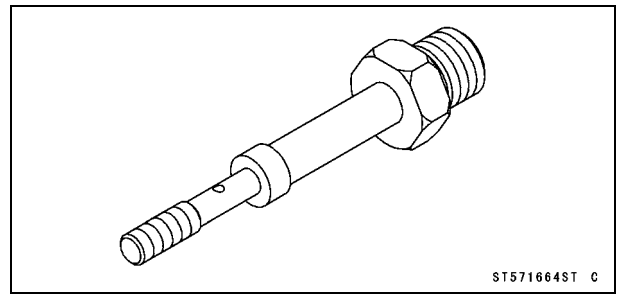
Gear Holder, m2.0:
57001-1557



Outside Circlip Pliers:
57001-144



Oil Pressure Gauge Adapter, M6 × 1.0:
57001-1664



Engine Oil and Oil Filter

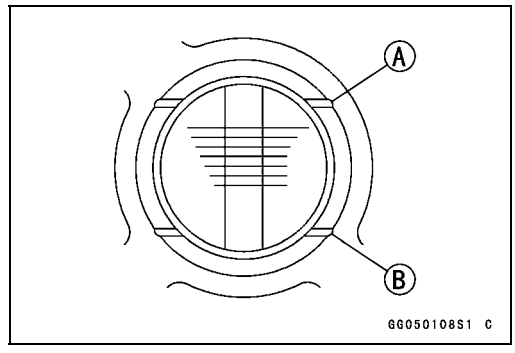
⚠ WARNING

Motorcycle operation with insufficient, deteriorated, or contaminated engine oil will cause accelerated wear and may result in engine or transmission seizure, accident, and injury.

The engine oil level indicated in the clutch cover oil level gauge is very sensitive to the motorcycle's position and engine rpm at time of shut down. Because of the semi-dry sump lubrication system with separate oil chambers in the crank room and transmission room, under certain conditions oil can accumulate in the crank room and give a false low reading at the oil level gauge, which indicates oil volume in the transmission room.

Engine Oil Level Inspection

- Situate the motorcycle so that it is vertical.
- Check that the engine oil level is between the upper [A] and lower levels [B] in the gauge.



NOTE

○*Situate the motorcycle so that it is perpendicular to the ground.*

○*If no oil appears in the gauge, tip the motorcycle slightly to the right until oil is visible then return to an upright position. If no oil appears even when tipped at an extreme angle, remove both drain bolts to empty any oil that may be in the transmission and crankcase, reinstall the drain bolts and refill with the specified amount of oil.*

○*If the motorcycle has just been used, wait several minutes for all the oil to drain down.*

○*If the oil has just been changed, start the engine and run it for several minutes* ***at idle speed****. This fills the oil filter with oil.*

○***Do not run the engine at high engine speed.*** *Stop the engine, then wait several minutes until the oil settles.*

CAUTION

Racing the engine before the oil reaches every part can cause engine seizure.

★If the oil level is too high, remove the excess oil through the filler opening, using a syringe or some other suitable device.

★If the oil level is too low, add the correct amount of oil through the oil filler opening. Use the same type and make of oil that is already in the engine.

NOTE

○*If the engine oil type and make are unknown, use any brand of the specified oil to top off the level rather than running the engine with the oil level low. Then at your earliest convenience, change the oil completely.*

Engine Oil Change

- Refer to the Engine Lubrication System in the Periodic Maintenance chapter.

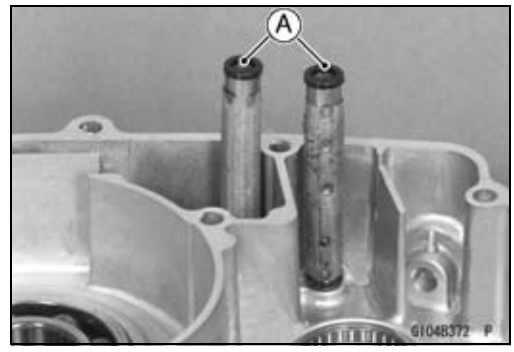
Engine Oil and Oil Filter

Oil Filter Change

- Refer to the Engine Lubrication System in the Periodic Maintenance chapter.

Oil Screen Cleaning

- Separate the crankcase (see Crankcase Disassembly in the Crankshaft/Transmission chapter).
- Remove the oil screens [A] from the crankcase.



- Clean the oil screens with a high-flash point solvent and remove any particles stuck to them.

○Clean the oil screens thoroughly whenever it is removed for any reason.

⚠ WARNING

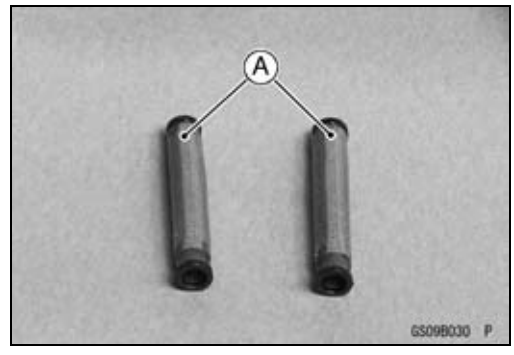
Clean the screen in a well-ventilated area, and take care that there is no spark or flame anywhere near the working area. Because of the danger of highly flammable liquids, do not use gasoline or low-flash point solvents.

NOTE

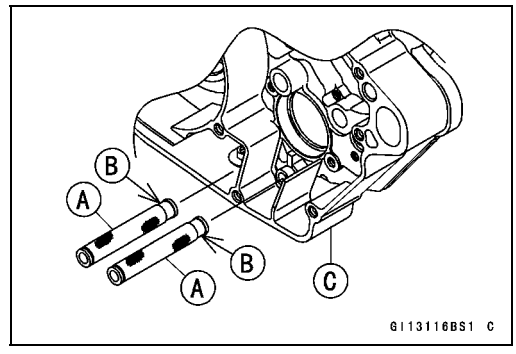
○*While cleaning the screens, check for any metal particles that might indicate internal engine damage.*

- Check the screens [A] carefully for any damage, holes, broken wires, gasket pulling off.

★If the screen is damaged, replace it.



- Install the oil screens [A] as shown.
  Longer Outcrop Pipe [B]
  Right Crankcase [C]
- Assemble the crankcase (see Crankcase/Transmission chapter)

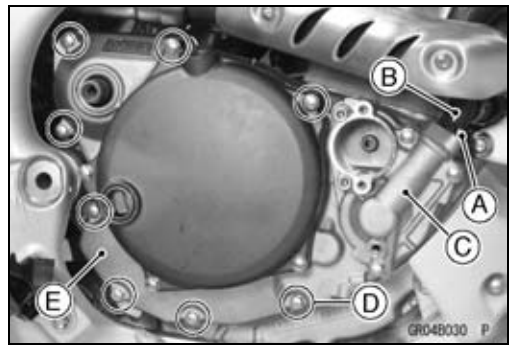


Oil Pump

Oil Pump Removal

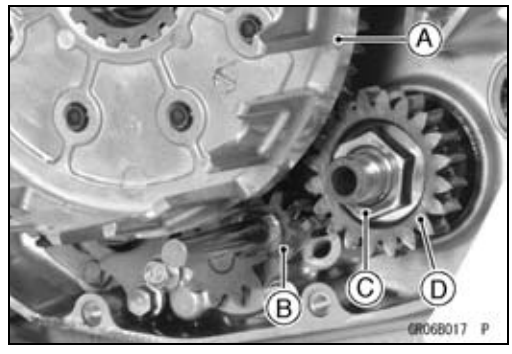
● Drain:
Engine Oil (see Engine Oil Change in the Periodic Maintenance chapter)
Coolant (see Coolant Draining in the Cooling System chapter)
● Remove:
Brake Pedal (see Brake Pedal Removal in the Brakes chapter)
Kick Pedal (see Kick Pedal Removal in the Engine Right Side chapter)

● Remove:
Water Pipe Bolt [A]
Water Pipe [B] (pull out)
Water Pump Cover [C]
Right Engine Cover Bolts [D]
● Remove the right engine cover [E].



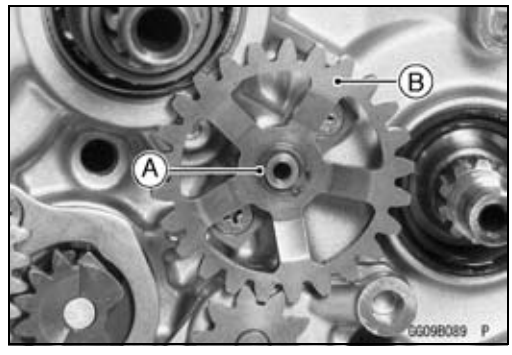
● Remove the clutch (see Engine Right Side chapter).
○Do not remove the clutch housing [A].
○Using the gear holder [B] to loosen the primary gear nut [C] (left-hand thread).
● Remove the primary gear [D].

Special Tool - Gear Holder, m2.0: 57001-1557

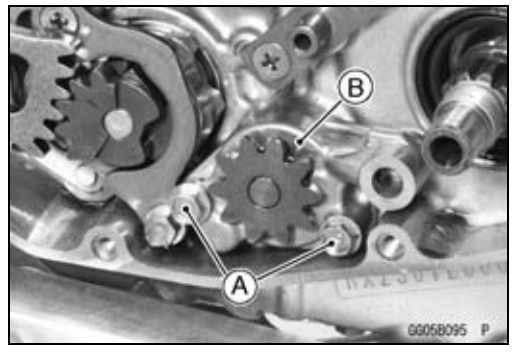


● Remove:
Circlip [A]
Oil Pump Idle Gear [B]

Special Tool - Outside Circlip Pliers: 57001-144

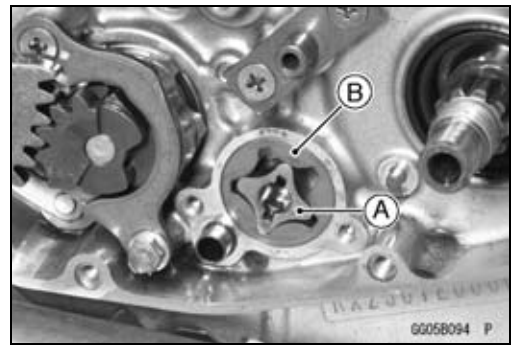


● Remove the mounting bolts [A] and remove the feed oil pump assembly [B].

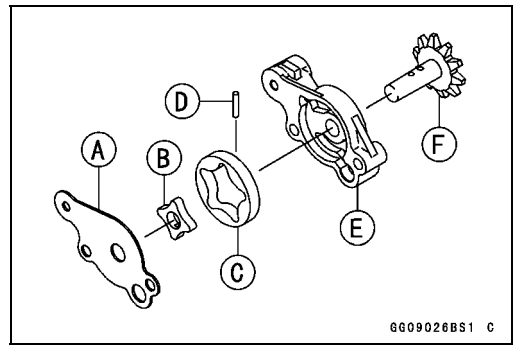


Oil Pump

● Remove the inner [A] and outer [B] rotors of the scavenge oil pump.

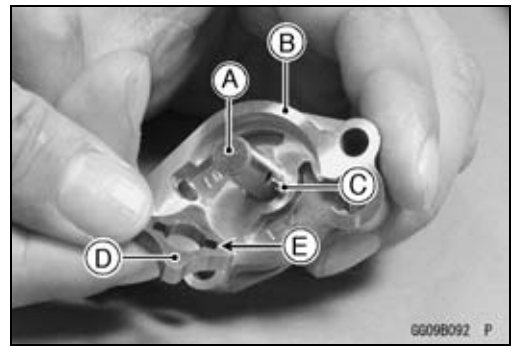


● Disassemble the feed oil pump assembly.
Oil Pump Cover [A]
Inner Rotor [B]
Outer Rotor [C]
Pin [D]
Oil Pump Body [E]
Oil Pump Gear [F]

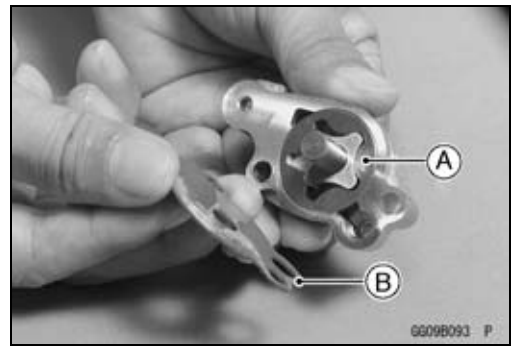


Oil Pump Installation

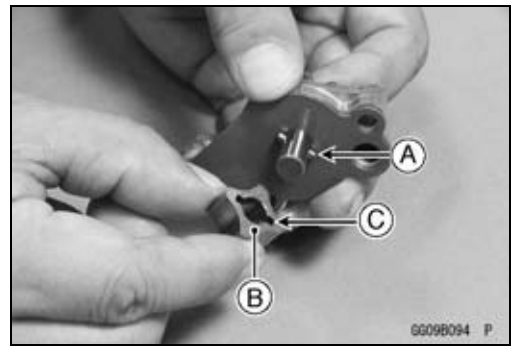
● Apply molybdenum disulfide grease to the shaft of the oil pump gear.
● Apply engine oil to the inner and outer rotors.
● Assemble the oil pump gear [A], body [B], pin [C] and inner rotor [D].
○Fit the slot [E] of the inner rotor on the pin.



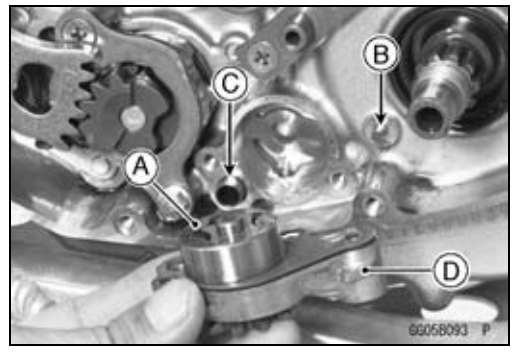
● Install the outer rotor [A] and cover [B].



● Install:
Pin [A]
Inner Rotor [B]
○Fit the slot [C] of the inner rotor on the pin.



Oil Pump



- Install the outer rotor [A].
- Install the dowel pin [B] and dowel pin [C].
- Install the scavenge and feed oil pump assembly [D].

- Apply a non-permanent locking agent to the oil pump mounting bolts.
- Tighten the oil pump mounting bolts.

Torque - Oil Pump Mounting Bolts: 7.0 N·m (0.7 kgf·m, 61 in·lb)

- Apply engine oil to the shaft sliding surface of the oil pump idle gear.
- Replace the circlip, and install new circlip with its sharp edge facing outward.

Special Tool - Outside Circlip Plier: 57001-144

- Install:
  Primary Gear (see Primary Gear Installation in the Engine Right Side chapter)
  Clutch (see Clutch Installation in the Engine Right Side chapter)
  Right Engine Cover (see Right Engine Cover Installation in the Engine Right Side chapter)

Oil Pump Inspection

- Disassemble the oil pump assemblies (see Oil Pump Removal).
- Visually inspect the oil pump body, outer rotors and the inner rotors.

★If the oil pump is any damage or uneven wear, replace the rotors, cover, or body, or the crankcase.

Oil Pressure

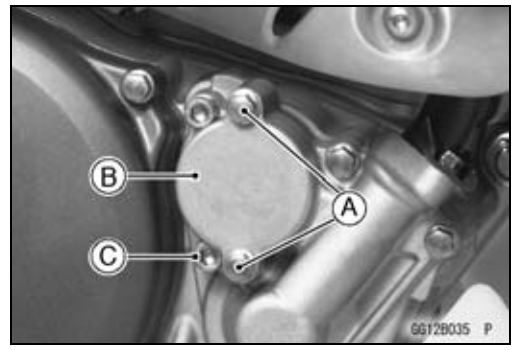
Oil Pressure Measurement

● Start the engine and warm up the engine thoroughly.

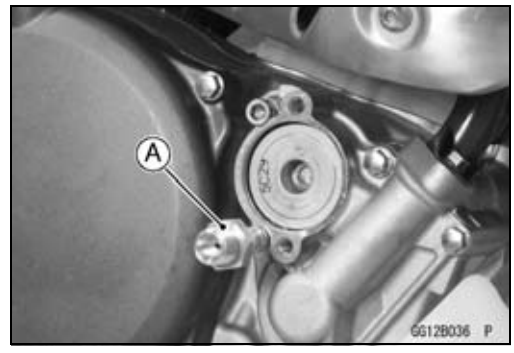
NOTE

○*Warm up the engine thoroughly before measuring the oil pressure.*

● Remove:
Oil Filter Cap Bolts [A]
Oil Filter Cap [B]
Water Pump Cover Bolt [C]

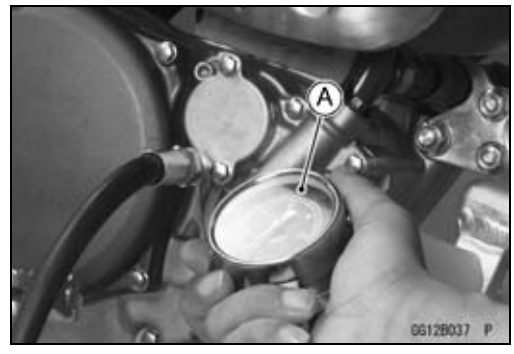


● Install the oil pressure gauge adapter [A] to the water pump cover.
● Install:
Oil Filter Cap (see Oil Filter Change in the Periodic Maintenance chapter)



● Attach the oil pressure gauge [A].

Special Tools - Oil Pressure Gauge, 5 kgf/cm²: 57001-125
Oil Pressure Gauge Adapter, M6 × 1.0: 57001-1664



● Run the engine at the specified speed, and read the oil pressure gauge.

Oil Pump Pressure (oil temperature 90°C, @4 000 rpm)
Standard: 19.6 kPa (0.2 kgf/cm², 2.8 psi)

★If the oil pressure is much lower than the standard, check the feed oil pump.
★If the reading is much higher than the standard, check the oil filter first, and oil passages for dirt or clogging.
● Stop the engine and remove the gauge and the oil pressure gauge adapter.

⚠ WARNING

Take care against burns from hot engine oil that will drain through the oil passage when the oil pressure gauge adapter is removed.

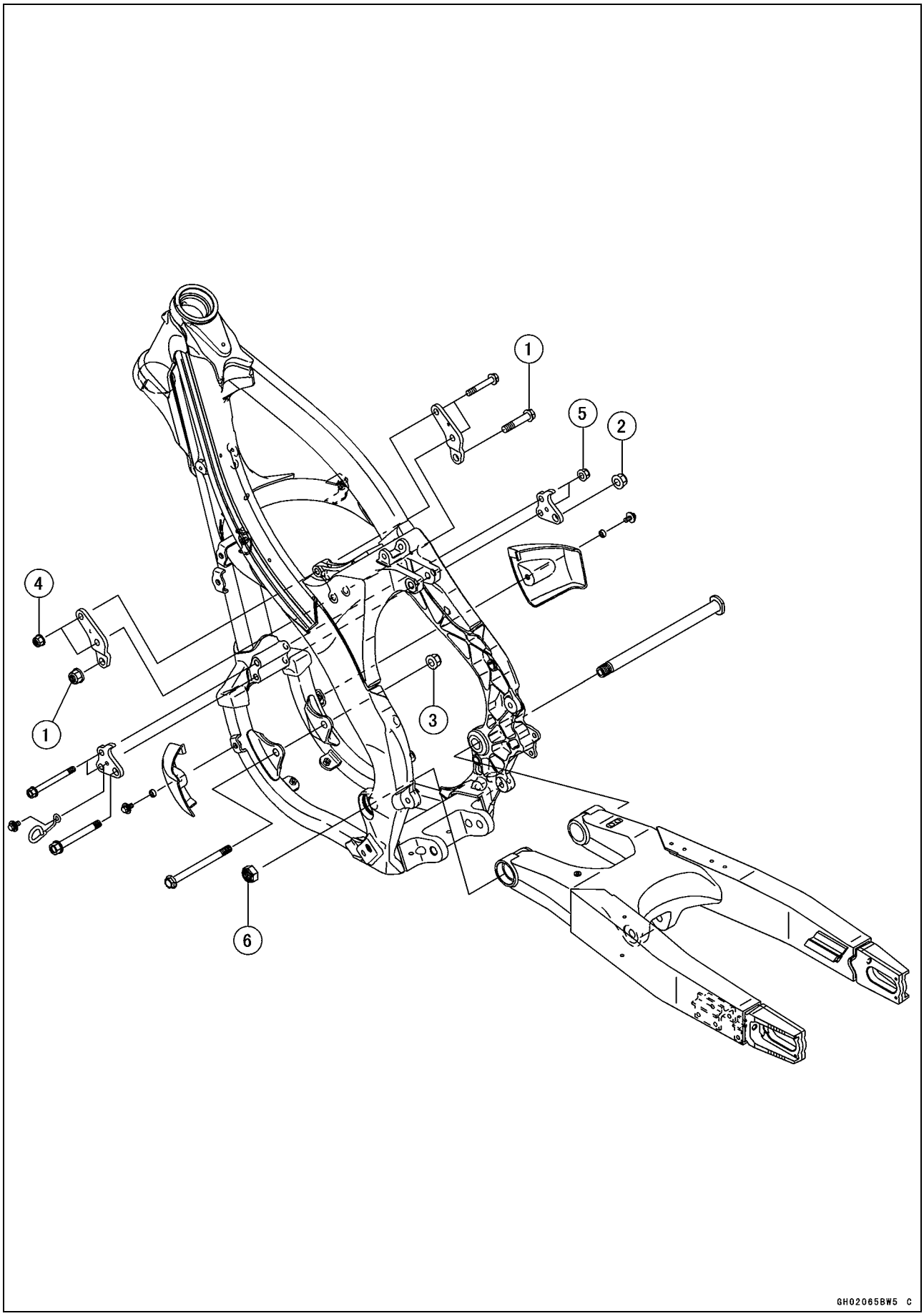
● Install the water pump cover bolt with washer and filter cap (see Engine Lubrication System section in the Periodic maintenance chapter).

Engine Removal/Installation

Table of Contents

Exploded View 8-2
Special Tools 8-4
Engine Removal/Installation 8-5
Engine Removal 8-5
Engine Installation 8-7

Exploded View

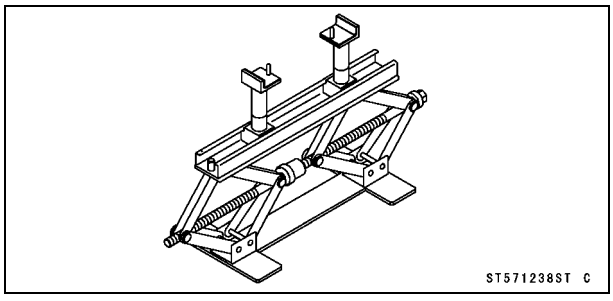


Exploded View

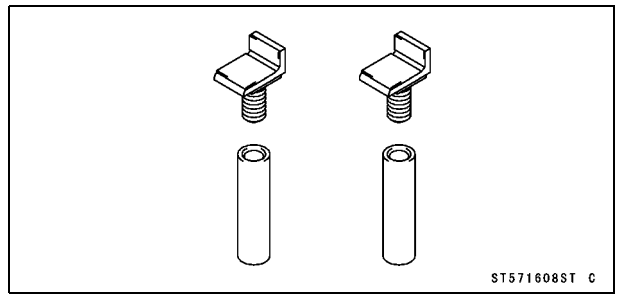
No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Upper Engine Mounting Bolt, Nut (M10)	49	5.0	36	
2	Middle Engine Mounting Bolt, Nut (M10)	49	5.0	36	
3	Lower Engine Mounting Bolt, Nut (M10)	49	5.0	36	
4	Upper Engine Bracket Bolts, Nuts (M8)	29	3.0	22	
5	Middle Engine Bracket Bolts, Nuts (M8)	29	3.0	22	
6	Swingarm Pivot Nut	98	10	72	

Special Tools

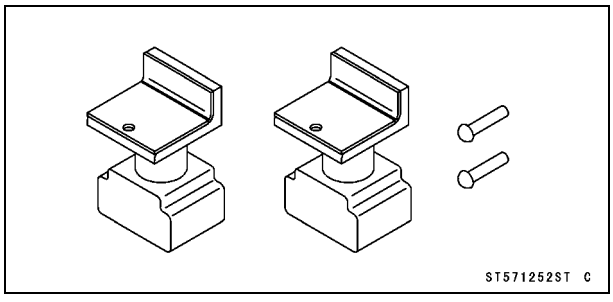
Jack:
57001-1238



Jack Attachment:
57001-1608



Attachment Jack:
57001-1252

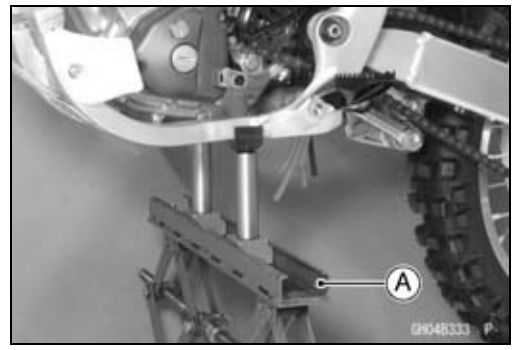


Engine Removal/Installation

Engine Removal

- Place the jack [A] under the frame to support the motorcycle.

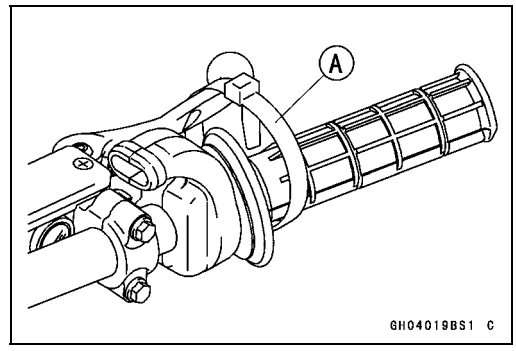
Special Tools - Jack: 57001-1238
Jack Attachment :57001-1252 or 57001-1608



⚠ WARNING

For engine removal, the swingarm pivot shaft must be pulled out, causing the swingarm and rear wheel assembly to become detached. To prevent the motorcycle from falling, make sure to support the frame with a jack.

- Squeeze the brake lever slowly and hold it with a band [A].



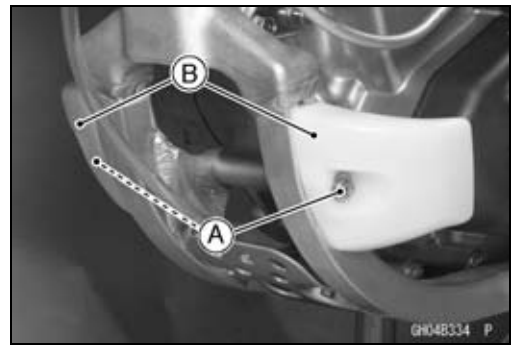
⚠ WARNING

Be sure to hold the front brake when removing the engine, or the motorcycle may fall over. It could cause an accident and injury.

CAUTION

Be sure to hold the front brake when removing the engine, or the motorcycle may fall over. The engine or the motorcycle could be damaged.

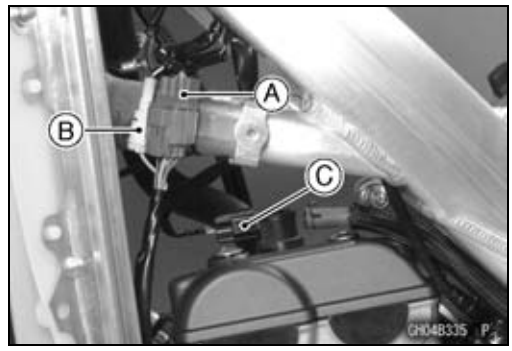
- Drain:
  Engine Oil (see Engine Oil Change in the Periodic Maintenance chapter)
  Coolant (see Coolant Draining in the Cooling System chapter)
- Remove the mounting bolt [A] and remove the engine guard [B].



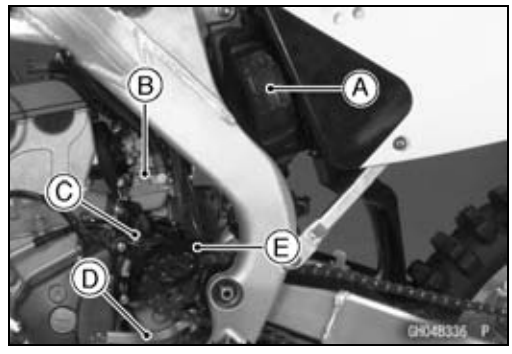
- Remove:
  Right Side Covers (see Side Cover Removal in the Frame chapter)
  Seat (see Seat Removal in the Frame chapter)
  Muffler Body (see Muffler Removal in the Engine Top End chapter)
  Fuel Tank (see Fuel Tank Removal in the Fuel System chapter)

Engine Removal/Installation

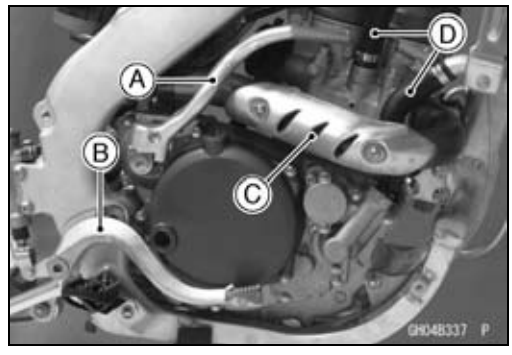
- Disconnect:
  Magneto Lead Connector [A]
  Neutral Switch Lead Connector [B]
- Remove:
  Stick Coil [C]



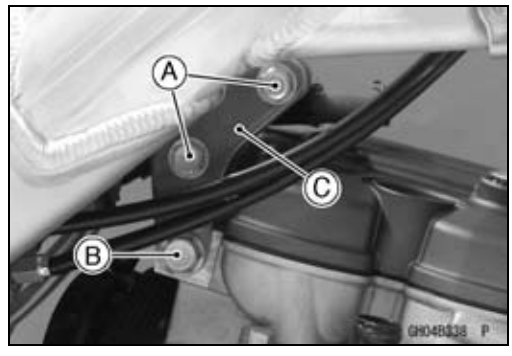
- Loosen:
  Carburetor Clamp Screws
- Remove:
  Inlet Duct with Rear Frame [A] (see Rear Frame Removal in the Frame chapter)
  Carburetor [B] (see Carburetor Removal in the Fuel System chapter)
  Clutch Cable Lower Part [C] (see Clutch Cable Removal in the Engine Right Side chapter)
  Shift Pedal [D]
  Engine Sprocket [E] (see Engine Sprocket Removal in the Final Drive chapter)



- Remove:
  Kick Pedal Assy [A] (see Kick Pedal Assy Removal in the Engine Right Side chapter)
  Rear Brake Pedal [B]
  Exhaust Pipe [C] (see Muffler Removal in the Engine Top End chapter)
  Water Hoses [D]

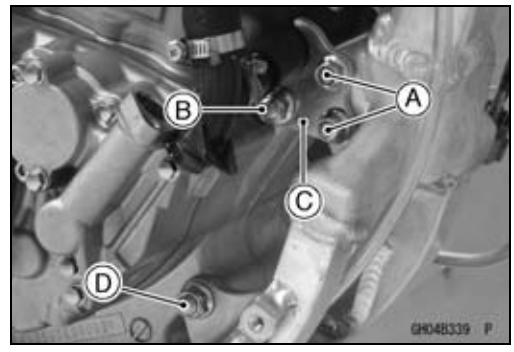


- Remove:
  Upper Engine Bracket Bolts [A]
  Upper Engine Mounting Bolt [B]
  Upper Engine Brackets [C]

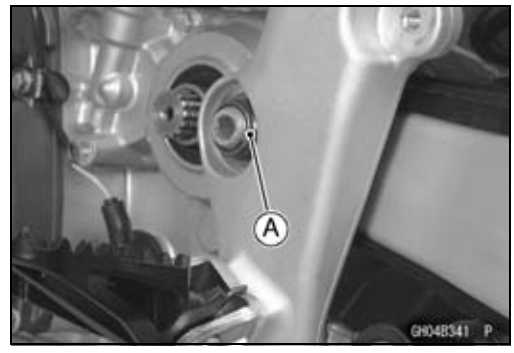


Engine Removal/Installation

● Remove:
Middle Engine Bracket Bolts [A]
Middle Engine Mounting Bolt [B]
Middle Engine Brackets [C]
Lower Engine Mounting Bolts [D]

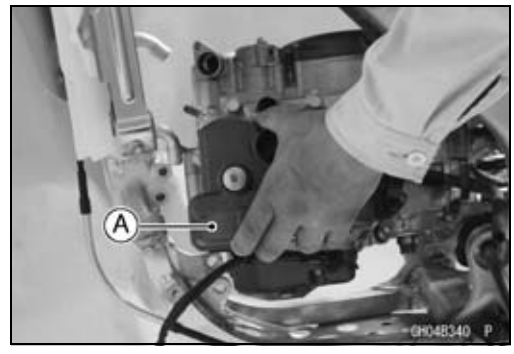


● Remove the swingarm pivot shaft [A].
○Pull out the swingarm pivot shaft half way from right side to free the engine.



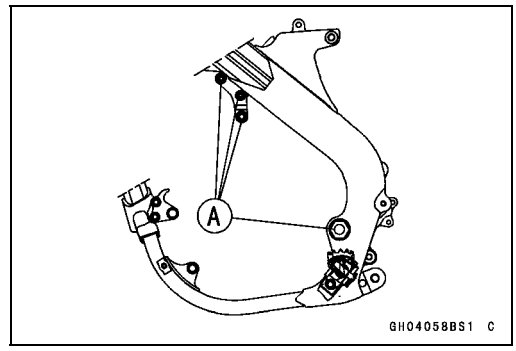
● Remove the engine from the vehicle to left side.
○First clear the engine rear portion from the swingarm and then move the engine left side.
○Second, settle the position of engine head and bottom horizontally to remove the engine.

Engine Installation
● Install the engine.
○First, insert the bottom portion of the engine [A] from the left side, and then up right it.
○Second, fit the rear portion of the engine to the swingarm.



● Install the pivot shaft, all engine bracket and mounting bolts temporarily.
○For the four locations [A] shown in the figure, insert the bolts and shaft from the right and attach the nuts from the left.
○For other locations, insert the engine mounting bolts from the left.
● Tighten the pivot shaft, engine mounting bolts and engine bracket bolts.

Torque - Swingarm Pivot Nut: 98 N·m (10 kgf·m, 72 ft·lb)
Engine Mounting Bolts, Nuts M10: 49 N·m (5.0 kgf·m, 36 ft·lb)
Engine Bracket Bolts, Nuts M8: 29 N·m (3.0 kgf·m, 22 ft·lb)



Engine Removal/Installation

- Install the removed parts.
- Run the cables, hoses, and leads according to the Cable, Wire and Hose Routing section of the Appendix chapter.
- Fill:
  Engine Oil (see Engine Oil Change in the Periodic Maintenance chapter)
  Coolant (see Coolant Filling in the Cooling System chapter)
- Adjust:
  Throttle Cable (see Throttle Grip Free Play Adjustment in the Periodic Maintenance chapter)
  Clutch Cable (see Clutch Adjustment in the Periodic Maintenance chapter)
  Drive Chain (see Drive Chain Slack Adjustment in the Periodic Maintenance chapter)
  Idling (see Idle Speed Adjustment in the Periodic Maintenance chapter)
- Check the brake effectiveness.

⚠ WARNING

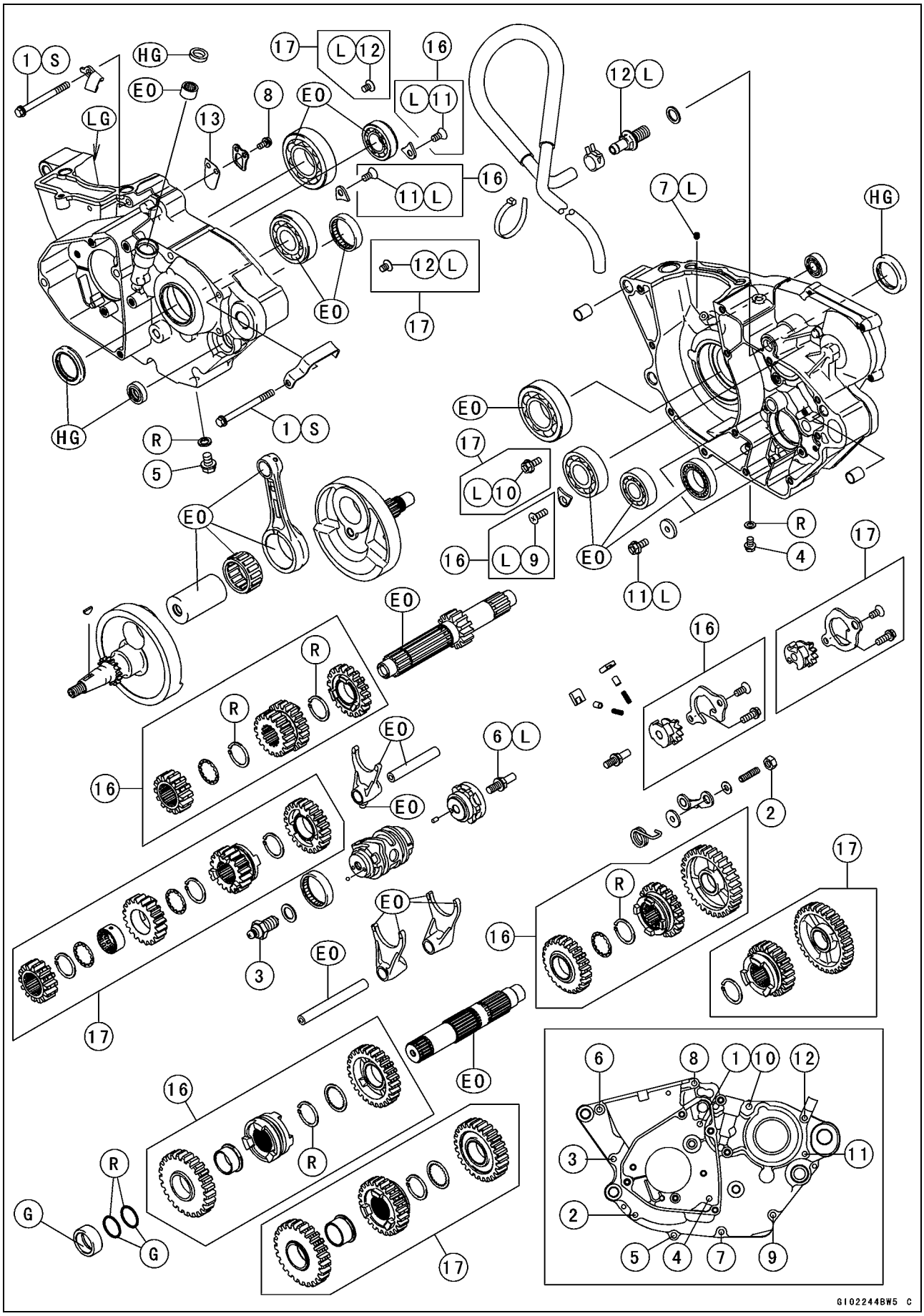
Do no attempt to drive the motorcycle until you pump the brake pedal until the pads are against the disc. The brake will not function on the first application of the pedal if this is not done.

Crankshaft/Transmission

Table of Contents

Exploded View 9-2
Specifications 9-4
Special Tools & Sealant 9-5
Crankcase 9-6
  Crankcase Disassembly 9-6
  Crankcase Assembly 9-8
Crankshaft 9-14
  Crankshaft Removal 9-14
  Crankshaft Installation 9-14
  Crankshaft Disassembly 9-14
  Crankshaft Assembly 9-14
  Crankshaft Inspection 9-15
  Connecting Rod Bend Inspection 9-17
  Connecting Rod Twist Inspection 9-17
Transmission 9-18
  Transmission Shaft Removal 9-18
  Transmission Shaft Installation 9-18
  Transmission Shaft Disassembly 9-19
  Transmission Shaft Assembly 9-19
  Shift Fork Bending Inspection 9-22
  Shift Fork/Gear Groove Wear Inspection 9-22
  Shift Fork Guide Pin/Shift Drum Groove Wear Inspection 9-22
  Gear Damage Inspection 9-22
Bearings/Oil Seals 9-23
  Bearing Replacement 9-23
  Bearing Inspection 9-23
  Oil Seal Inspection 9-24

Exploded View



Exploded View

No.	Fastener	Torque			Re-marks
		N·m	kgf·m	ft·lb	
1	Crankcase Bolts	9.8	1.0	87 in·lb	S
2	Gear Set Lever Nut	8.8	0.9	78 in·lb	
3	Neutral Switch	12	1.2	104 in·lb	
4	Engine Oil Drain Bolt (For Crank Room Oil Sump)	7.0	0.7	61 in·lb	
5	Engine Oil Drain Bolt (For Transmission Room Oil Sump)	20	2.0	14.5	
6	Shift Drum Cam Bolt	24	2.4	17	L
7	Piston Oil Nozzle	2.9	0.29	26 in·lb	
8	Reed Valve Screws	7.0	0.7	61 in·lb	
9	Drive Shaft Bearing Retaining Screw (KX250T6F)	6.4	0.65	56 in·lb	L
10	Drive Shaft Bearing Retaining Bolt (KX250T7F ~)	9.8	1.0	87	L
11	Output Shaft Bearing Retaining Screw (KX250T6F)	6.4	0.65	56 in·lb	L
12	Output Shaft Bearing Retaining Bolts (KX250T7F ~)	12	1.2	104	L
13	Shift Drum Bearing Retaining Bolts	9.8	1.0	87 in·lb	L
14	Breather Fitting	15	1.5	11	L

15. Reed Valve
16. KX250T6F
17. KX250T7F ~

EO: Apply engine oil.
HG: Apply high temperature grease.
L: Apply a non-permanent locking agent.
LG: Apply liquid gasket.
R: Replacement parts
S: Tighten the fasteners following the specified sequence.

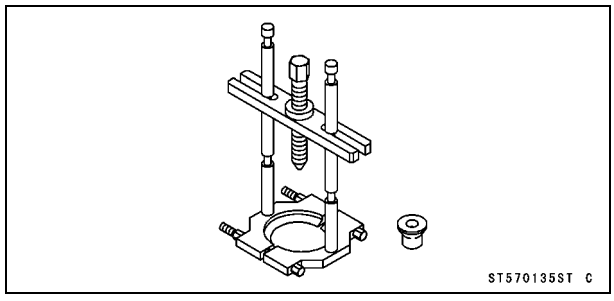
Specifications

Item	Standard	Service Limit
Connecting Rods		
Connecting Rod Big End Radial Clearance	0.002 ~ 0.014 mm (0.00008 ~ 0.0006 in.)	0.06 mm (0.0024 in.)
Connecting Rod Big End Side Clearance	0.25 ~ 0.35 mm (0.0098 ~ 0.0138 in.)	0.55 mm (0.0217 in.)
Crankshaft Runout	TIR 0.03 mm (0.0012 in.) or less	TIR 0.08 mm (0.0031 in.)
Transmission		
Shift Fork Ear Thickness	4.9 ~ 5.0 mm (0.1929 ~ 0.1969 in.)	4.8 mm (0.1890 in.)
Gear Shift Fork Groove Width	5.05 ~ 5.15 mm (0.1988 ~ 0.2028 in.)	5.25 mm (0.2070 in.)
Shift Fork Guide Pin Diameter	5.9 ~ 6.0 mm (0.2323 ~ 0.2362 in.)	5.8 mm (0.2283 in.)
Shift Drum Groove Width	6.05 ~ 6.20 mm (0.2382 ~ 0.2441 in.)	6.3 mm (0.2480 in.)

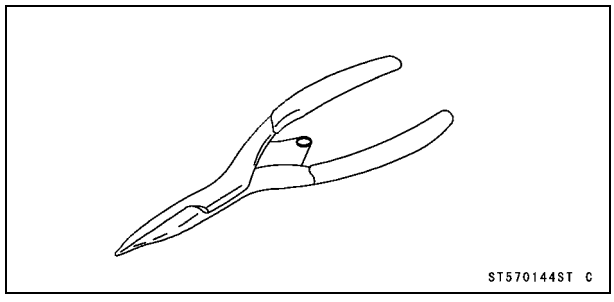
TIR: Total Indicator Readings

Special Tools & Sealant

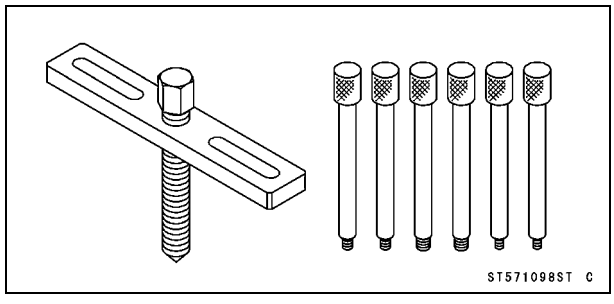
Bearing Puller:
57001-135



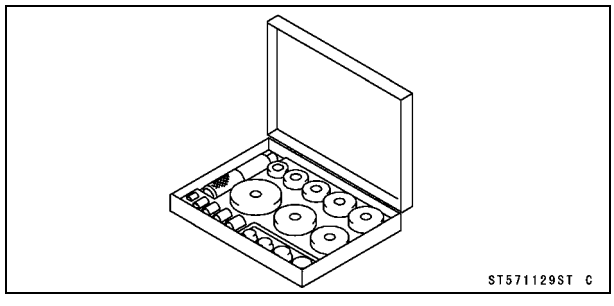
Outside Circlip Pliers:
57001-144



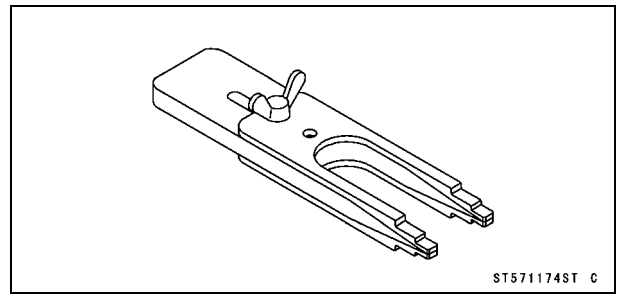
Crankcase Splitting Tool Assembly:
57001-1098



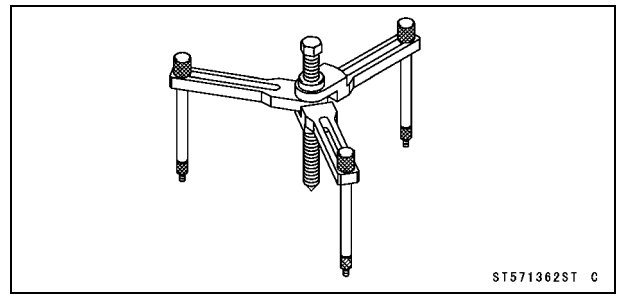
Bearing Driver Set:
57001-1129



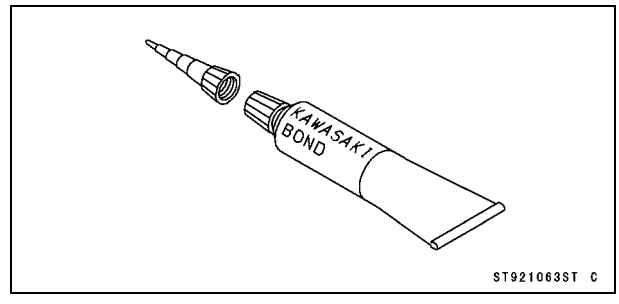
Crankshaft Jig:
57001-1174



Crankcase Splitting Tool Assembly:
57001-1362



Kawasaki Bond (Liquid Gasket - Gray):
92104-1063

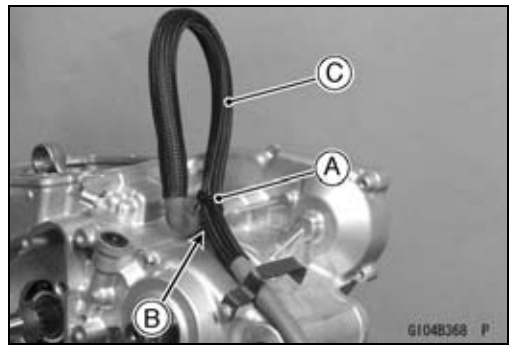


Crankcase

Crankcase Disassembly

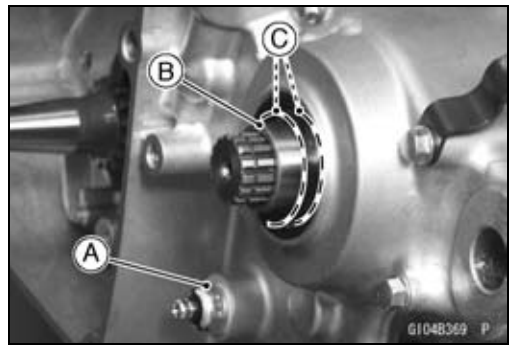
- Remove the engine from the frame (see Engine Removal/Installation in the Engine Removal/Installation chapter)
- Set the engine on clean surface while parts are being removed.
- Remove:
  Cylinder Head Cover (see Cylinder Head Cover Removal in the Engine Top End chapter)
  Camshaft Chain Tensioner (see Camshaft Chain Tensioner Removal in the Engine Top End chapter)
  Cylinder Head (see Cylinder Head Removal in the Engine Top End chapter)
  Piston (see Piston Removal in the Engine Top end chapter)
  Right Engine Cover (see Right Engine Cover Removal in the Engine Right Side chapter)
  Clutch (see Clutch Removal in the Engine Right Side chapter)
  Primary Gear (see Primary Gear Removal in the Engine Right Side chapter)
  Oil Pump Idle Gear (see Oil Pump Removal in the Engine Lubrication System chapter)
  Oil Pumps (see Oil Pump Removal in the Engine Lubrication System chapter)
  Kickstarter Assembly (see Kickstarter Removal in the Engine Right Side chapter)
  Kickstarter Idle Gear (see Idle Gear Removal in the Engine Right Side chapter)
  External Shift Mechanism (see External Shift Mechanism Removal in the Engine Right Side chapter)
  Flywheel Magneto (see Flywheel Magneto Removal in the Electrical System chapter)

- Cut the band [A].
- Remove:
  Clamp [B]
  Breather Hose [C]



- Remove:
  Neutral Switch [A]
- Remove the output shaft sleeve [B] and the O-rings [C].

○Do not reuse the O-rings.

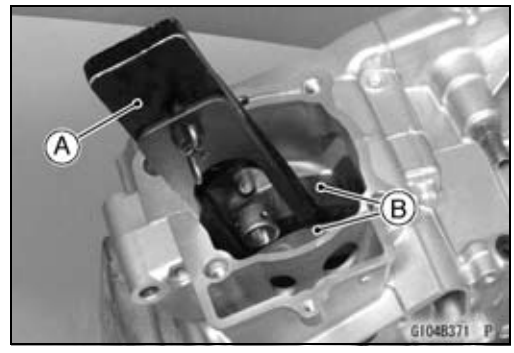


Crankcase

● Remove the crankcase bolts [A].

● Install the jig [A] between the crankshaft flywheels [B].

Special Tool - Crankshaft Jig: 57001-1174

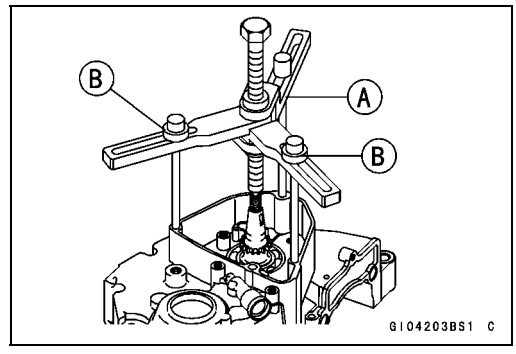


● Attach the crankcase splitting tool [A] to the left crankcase.

○Adjust the gap is between the splitting tool arm and adapter, using the collars or nuts [B].

○Use the adapter (57001-136) of crankcase splitting tool assembly (57001-1098) attached.

Special Tools - Crankcase Splitting Tool Assembly: 57001 -1362 and 57001-1098



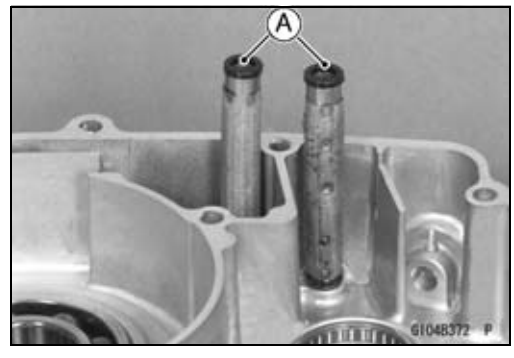
● Tighten the center bolt of the crankcase splitting tool to split the crankcase halves.

○The front and rear portion of the crankcase must be pulled apart evenly.

○Remove the left crankcase half.

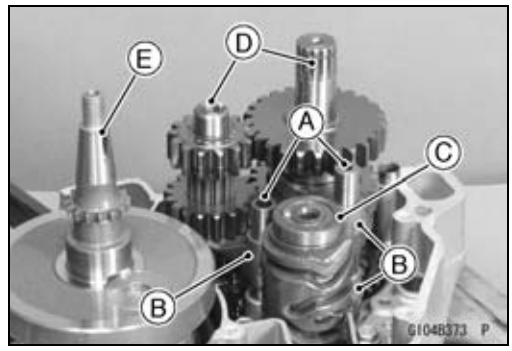
● Remove:

Oil Screens [A] (see Transmission Shaft Removal)



Crankcase

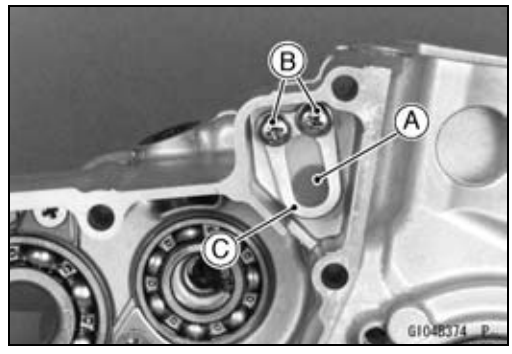
● Remove:
Shift Rods [A] (see Transmission Shaft Removal)
3 Shift Forks [B] (see Transmission Shaft Removal)
Shift Drum [C] (see Transmission Shaft Removal)
Transmission [D] (see Transmission Shaft Removal)
Crankshaft [E] (see Crankshaft Removal)



● Remove the reed valve [A] from the left crankcase half.
○Unscrew the screws [B] and remove the guide [C].

CAUTION

Do not remove the bearings and the oil seals unless it is necessary.
Removal may damage them.



Crankcase Assembly

CAUTION

Right and left crankcase halves are machined at the factory in the assembled state, so if replaced, they must be replaced as a set.

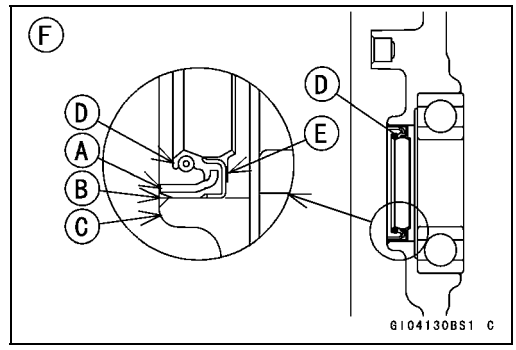
● Remove the old gasket from the mating surfaces of the crankcase halves and clean them off with a high-flash point solvent.
● Using compressed air, blow out the oil passages in the crankcase halves.

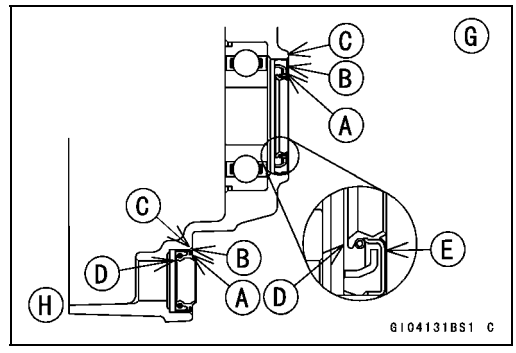
⚠ WARNING

Clean the engine parts in a well-ventilated area, and take care that there are no sparks or flame anywhere near the working area; this includes any appliance with a pilot light. Do not use gasoline or a low-flash point solvent to clean parts. A fire or explosions could result.

Crankcase

- Be sure to replace any oil seal removed with a new one.
- Press in the new oil seals using a press and bearing driver so that the seal surface [A] is flush [B] with the surface of the crankcase [C].
- Apply high-temperature grease to the oil seal lips [D].
  Right Crankcase Oil Seal [F]
  Metal Side Face [E]
  Left Crankcase Oil Seals (output shaft [G], shift shaft [H])

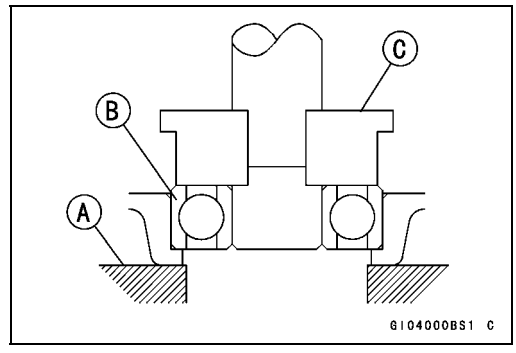




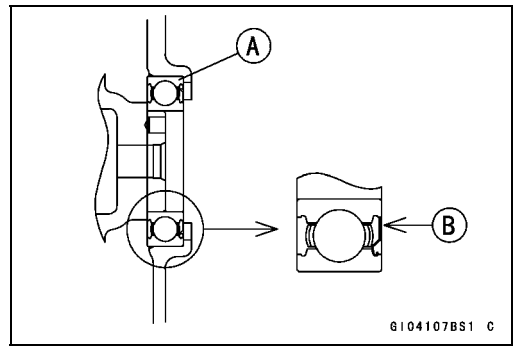
- Support the crankcase bearing boss with a suitable retainer [A].
- Using a press and the bearing driver set [C], install a new bearing [B] until it bottoms out.

Special Tool - Bearing Driver Set: 57001-1129

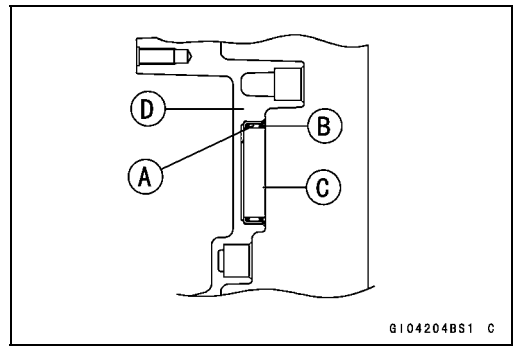
CAUTION
Support the crankcase bearing boss when the bearing is pressed, or the crankcase could be damaged.



- Press the new drive shaft and new shift drum bearing [A] in the right crankcase half, so that the sealed side [B] faces outside of the engine.



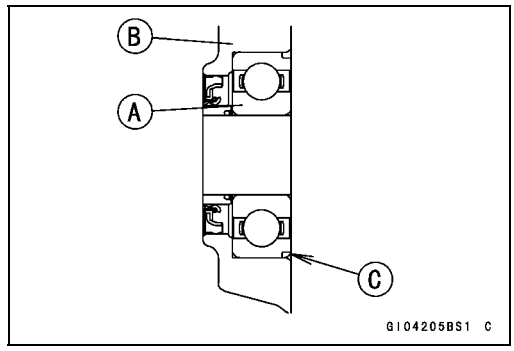
- Press in the new shift drum needle bearing [A] using a press and bearing driver set so that the bearing surface [B] is flush [C] with the surface of the crankcase [D].



Crankcase

- Press the new output shaft bearings [A] in the left crankcase half [B], so that the stepped side [C] faces inside of the engine.

Special Tool - Bearing Driver Set: 57001-1129



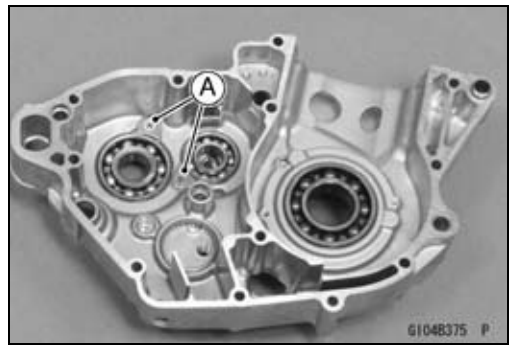
[KX250T6F]

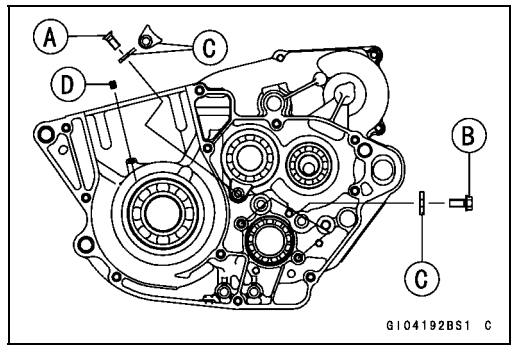
- Apply a non-permanent locking agent to the retaining screws [A] and bolts [B].
- Install the retainers [C].

Torque - Bearing Retaining Screws: 6.4 N·m (0.65 kgf·m, 56 in·lb)
Bearing Retaining Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)

- Install the piston oil nozzle [D].

Torque - Piston Oil Nozzle: 2.9 N·m (0.29 kgf·m, 26 in·lb)





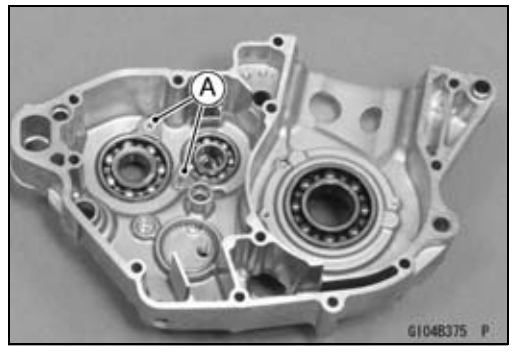
[KX250T7F ~]

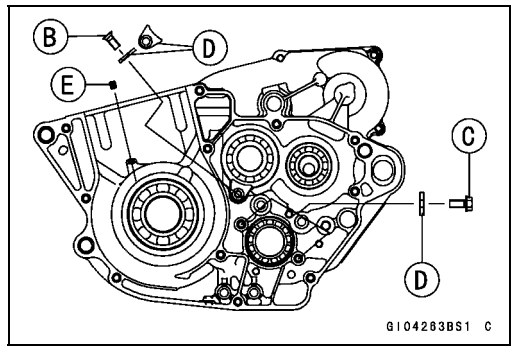
- Apply a non-permanent locking agent to the retaining bolts [A], [B], [C].
- Install the retainers [D].

Torque - Output Shaft Bearing Retaining Bolts: 12 N·m (1.2 kgf·m, 104 in·lb) [A]
Drive Shaft Bearing Retaining Bolt: 9.8 N·m (1.0 kgf·m, 87 in·lb) [B]
Shift DrumBearing Retaining Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb) [C]

- Install the piston oil nozzle [E].

Torque - Piston Oil Nozzle: 2.9 N·m (0.29 kgf·m, 26 in·lb)



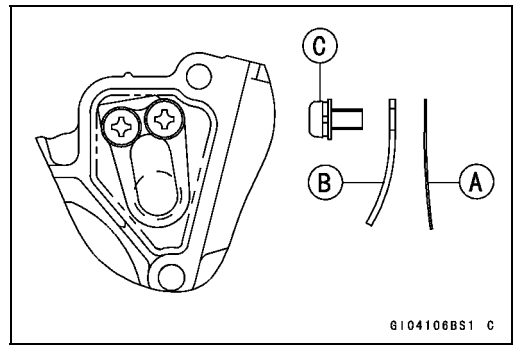


Crankcase

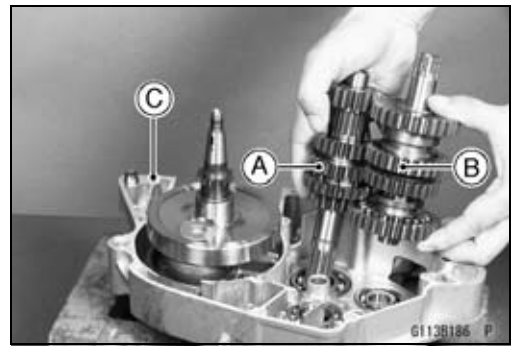
● Install the reed valve [A] direction as shown.
Guide [B]
Screws [C]

Torque - Reed Valve Screws: 7.0 N·m (0.7 kgf·m, 61 in·lb)

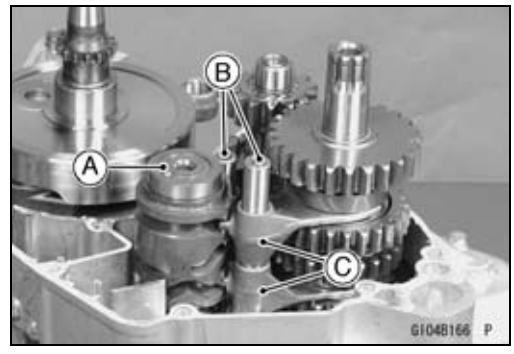
● Install:
Crankshaft (see Crankshaft Installation)



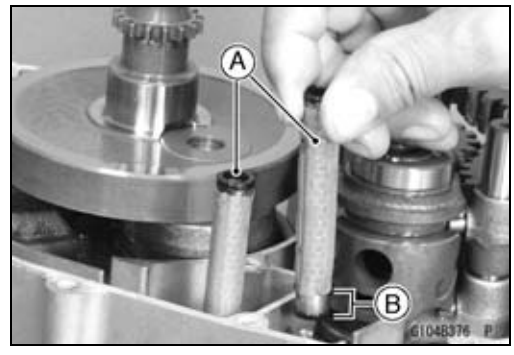
● Apply engine oil to the transmission gears, bearings, shift forks, shift drum and crankshaft bearing.
● Install the drive shaft [A] and output shaft [B] in the right crankcase [C] as a set.



● Install:
Shift Drum [A] (see Transmission Installation)
Shift Rods [B] (see Transmission Installation)
Shift Forks [C] (see Transmission Installation)

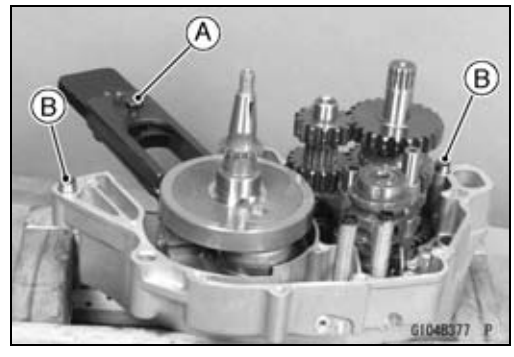


● Install:
Oil Screens [A]
○Install the oil screen so that the longer pipe side [B] faces in right crankcase.



● With the connecting rod positioned at the bottom-dead -center, install the crankshaft jig [A].
● Check to see that the dowel pins [B] are in place in the mating surfaces of the crankcase halves.

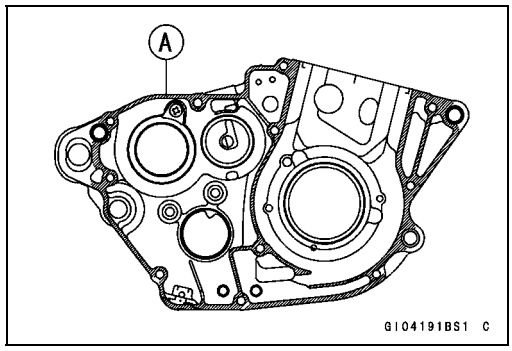
Special Tool - Crankshaft Jig: 57001-1174



Crankcase

● Apply liquid gasket to the mating surface [A] of the left crankshaft half.

Sealant - Kawasaki Bond (Liquid Gasket - Gray): 92104 -1063

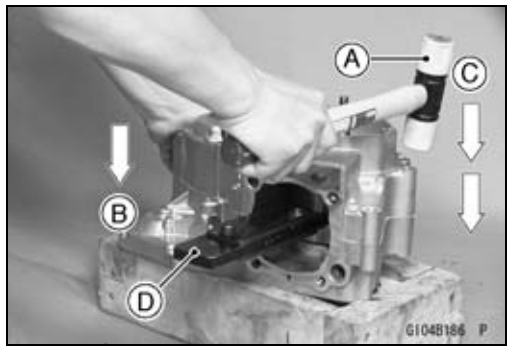


NOTE

○*Make the application finish within 20 minutes when the liquid gasket to the mating surface of the left crankcase half is applied.*

○*Moreover fit the case and tighten the case bolts just after finishing the application of the liquid gasket.*

● Using a plastic hammer [A], press [B] the rear portion of the crankcase, and tap [C] the area around the crankshaft of the left crankcase. While maintaining the mating surfaces of the right and left crankcase halves constantly parallel, mate the crankcase halves evenly.



NOTE

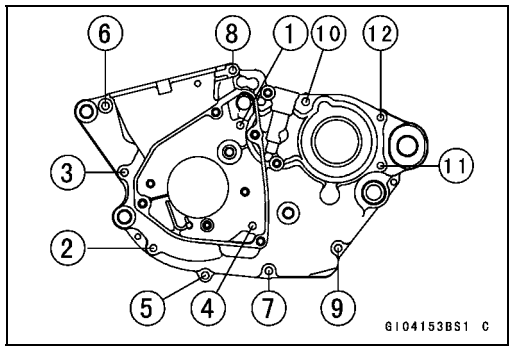
○*Constantly check the alignment of the two crankcase halves, and the position of the transmission shafts, and shift drum. The front and rear of the crankcase must be pushed together evenly.*

● Remove the crankshaft jig [D].

● Tighten the crankcase bolts, starting with the periphery of the crankshaft, then outward.

○Tighten the [8], [12] bolts with the clamp.

Torque - Crankcase Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)

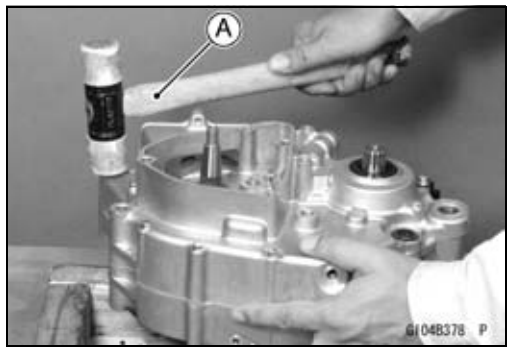


NOTE

○*After tightening the crankcase bolts, wipe up the liquid gasket seeping out around the mating surface, especially around the area.*

● Make sure that the crankshaft, driveshaft, and the output shaft, rotate smoothy (in the neutral position).

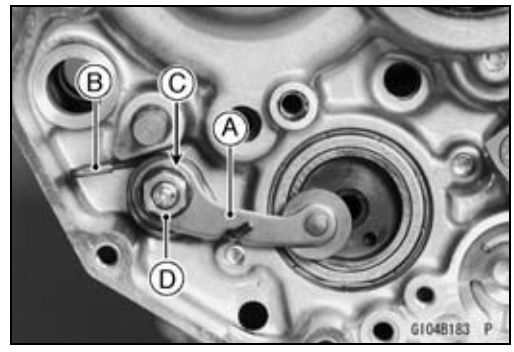
★If the crankshaft will not turn, probably the crankshaft is not centered; tap the mount portion of the crankcase with a plastic hammer [A] to reposition it. If it does not free up, split the crankcase again and find the cause.



Crankcase

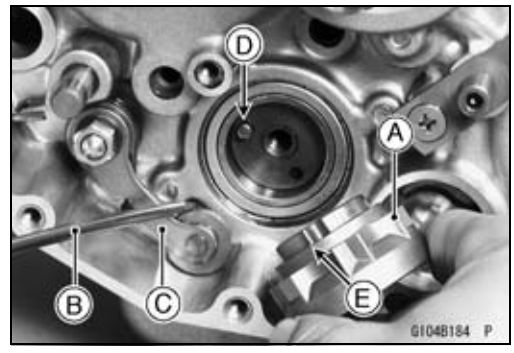
- Install the gear set lever [A].
  ○Fit each end of the spring [B] to original positions.
  ○Do not forget to install the colar and washer [C].
- Tighten the gear set lever nut [D].

Torque - Gear Set Lever Nut: 8.8 N·m (0.9 kgf·m, 78 in·lb)



- To install the shift drum cam [A], use the driver [B] to bring the gear set lever [C] to the bottom of the crankcase.
- Mate the shift drum pin [D] into the shift drum hole.
  ○Fit the groove [E] of the shift drum cam on the shift drum pin.
- Apply non-permanent locking agent to the shift drum cam bolt and tighten it.

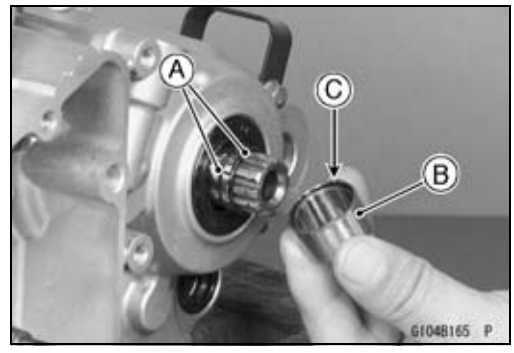
Torque - Shift Drum Cam Bolt: 24 N·m (2.4 kgf·m, 17 ft·lb)



- Check to see that gears shift smoothly from 1st to 5th gear, and 5th to 1st while spinning the output shaft.
- Set the shift drum in the neutral position.

- Replace the O-rings [A] on the output shaft with new ones.
- Install two O-rings on the grinding faces of the output shaft while expanding the O-ring by the hand.
- Apply grease to the inside of the output shaft collar [B].
- Insert the collar with the oil groove end facing [C] in.
- Install the other removed parts.

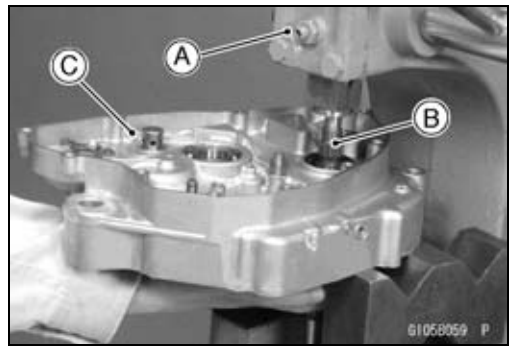
Torque - Neutral Switch: 12 N·m (1.2 kgf·m, 104 in·lb)



Crankshaft

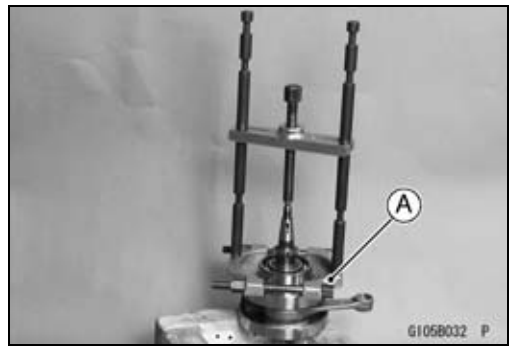
Crankshaft Removal

- Disassemble the crankcase (see Crankcase Disassembly).
- Remove the transmission shaft (see Transmission Shaft Removal).
- Using the hand press [A], remove the crankshaft [B] from the right crankcase [C].



★If the bearing stay on the crankshaft when splitting the crankcase, or removing the crankshaft from the right crankcase, remove the bearings from the crankshaft with a bearing puller.

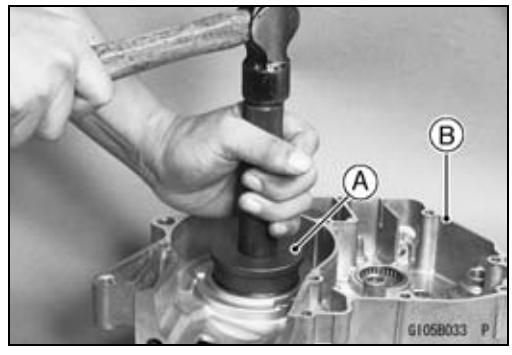
Special Tool - Bearing Puller [A]: 57001-135



Crankshaft Installation

- Apply high-temperature grease to the outer side of the crankshaft bearings and use the bearing driver set [A] and a press to drive the bearing to the bottom of the crankcase [B]. While driving the bearing in, make sure to use a holder to support the boss area.

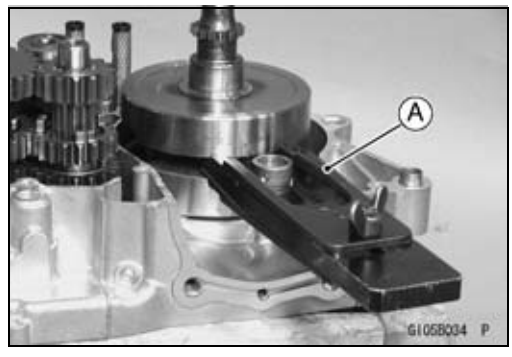
Special Tool - Bearing Driver Set: 57001-1129



- Insert the crankshaft jig [A] between the crankshaft flywheels opposite the connecting rod big end to protect flywheel alignment as shown, and press the crankshaft into the right crankcase.
- When pressing, position the jig in the crankcase opening so the jig does not hit the crankcase.

Special Tool - Crankshaft Jig: 57001-1174

- Apply engine oil to the connecting rod big end bearing.



Crankshaft Disassembly

Since assembly of the crankshaft demands exacting tolerances, the disassembly and reassembly of the crankshaft can only be done by a shop having the necessary tools and equipment.

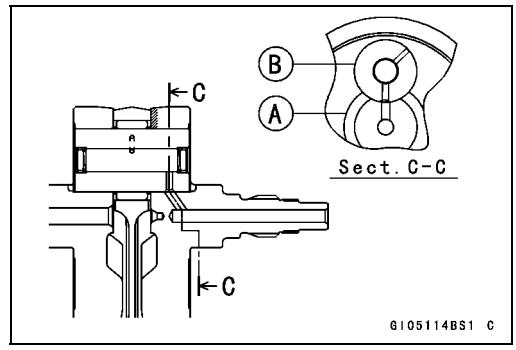
- If it should be necessary to disassemble the crankshaft, use a press to remove the crankpin.

Crankshaft Assembly

Since the assembly of the crankshaft demands exacting tolerances, the disassembly and reassembly of the crankshaft can only be done by a shop having the necessary tools and equipment.

Crankshaft

● Carefully align the oil passage hole in the right flywheel [A] with the one in the crankpin [B] at rebuilding of the crankshaft as shown.



● Reassemble the crankshaft according to the standard tolerances in Specifications.

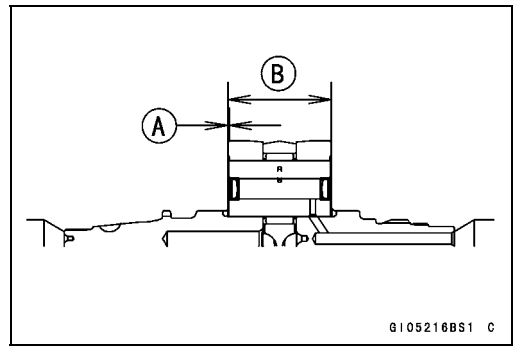
○Connecting rod bend, twist (see Connecting Rod Bend, Connecting Rod Twist).

○Connecting rod big end radial clearance (see Crankshaft Inspection).

○Cold-fitting tolerance between crankpin and flywheels.
0.3 ~ 0.7 mm [A]
56 mm [B]

○Side clearance between the connecting rod big end and one of flywheels (see Crankshaft Inspection).

○Crankshaft runout (see Crankshaft Inspection).



Crankshaft Inspection

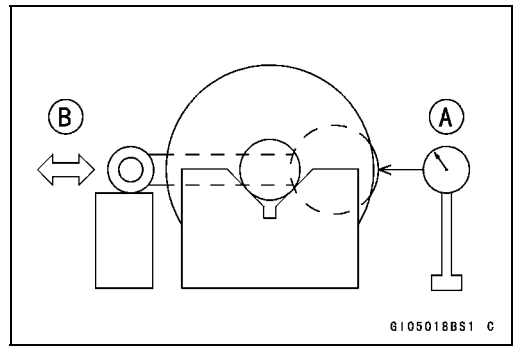
Connecting Rod Big End Radial Clearance Inspection

● Set the crankshaft on V blocks, and place a dial gauge [A] against the connecting rod big end.

● Push [B] the connecting rod first towards the gauge and then in the opposite direction. The difference between two gauge readings is the radial clearance.

Connecting Rod Big End Radial Clearance Inspection
Standard: 0.002 mm ~ 0.014 mm (0.00008 ~ 0.0006 in.)
Service Limit: 0.06 mm (0.0024 in.)

★If the radial clearance exceeds the service limit, crankshaft should be either replaced or disassembled and crankpin, needle bearing, and connecting rod big end should be examined for wear.

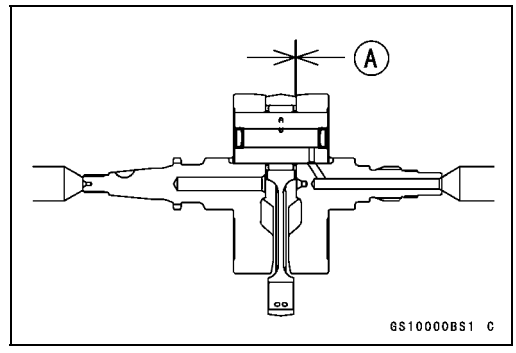


Connecting Rod Big End Side Clearance Inspection

● Measure the connecting rod big end side clearance [A].

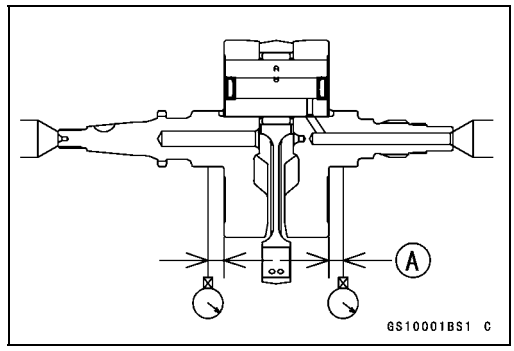
Connecting Rod Big End Side Clearance
Standard: 0.25 ~ 0.35 mm (0.0098 ~ 0.0138 in.)
Service Limit: 0.55 mm (0.0217 in.)

★If the clearance exceeds the service limit, replace the crankshaft assembly.



Crankshaft

Crankshaft Runout Inspection

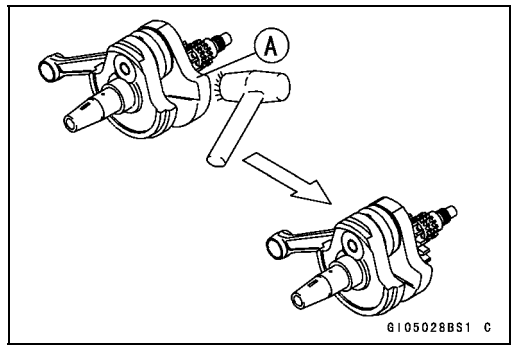


- Set the crankshaft in a flywheel alignment jig or on V blocks, and place a dial gauge as shown and turn the crankshaft slowly. The maximum difference in gauge reading is the crankshaft runout.

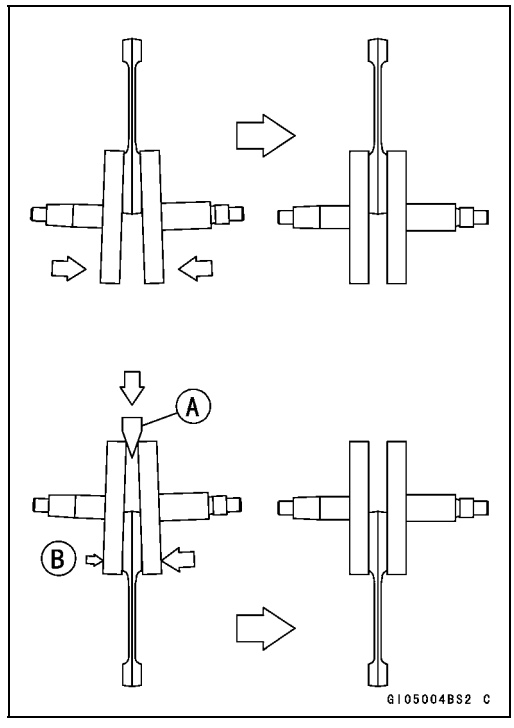
Standard: TIR 0.03 mm (0.0012 in.) or less

Service Limit: TIR 0.08 mm (0.0031 in.)

★If the runout at either point exceeds the service limit, replace the crankshaft assembly with a new one or align the crankshaft so that the runout falls within the service limit.
8 mm (0.354 in.) [A]



- First correct the horizontal misalignment by striking the projecting crank half [A] with a plastic, soft lead, or brass hammer as shown.
- Recheck the runout with a dial gauge and repeat the process until the runout falls within the service limit.



- Next, correct the vertical misalignment by either driving a wedge [A] in between the crank halves or by squeezing them in a vice, depending on the nature of the misalignment.

CAUTION
Do not hammer the crank half at the point [B].

★If flywheel misalignment cannot be corrected by the above method, replace the crankpin or the crankshaft itself.

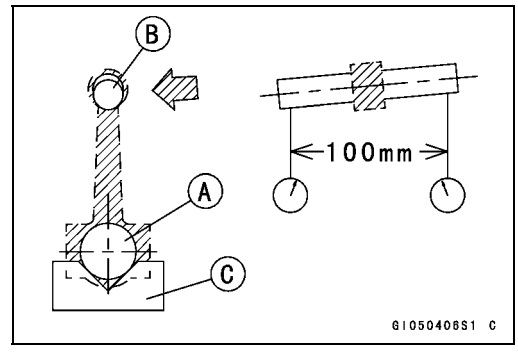
Connecting Rod Big End Seizure Inspection

★In case of serious seizure with damaged flywheels, the crankshaft must be replaced.

★In case of less serious damage, disassemble the crankshaft and replace the crankpin, needle bearing, and connecting rod.

Crankshaft

Connecting Rod Bend Inspection

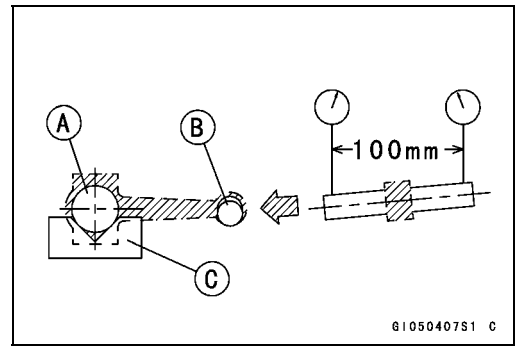


- Remove the connecting rod.
- Select an arbor [A] of the same diameter as the connecting rod big end, and insert the arbor through the connecting rod big end.
- Select an arbor of the same diameter as the piston pin and more than 105 mm long, and insert the arbor [B] through the connecting rod small end.
- On a surface plate, set the big-end arbor on a V block [C].
- With the connecting rod held vertically, use a height gauge to measure the difference in the height of the arbor above the surface plate over a 100 mm length to determine the amount of connecting rod bend.

★If connecting rod bend exceeds the service limit, the connecting rod must be replaced.

Connecting Rod Bend
Service Limit: TIR 0.2/100 mm (0.08/3.94 in.)

Connecting Rod Twist Inspection



- With the big-end arbor [A] still on the V block [C], hold the connecting rod horizontally and measure the amount that the arbor [B] varies from being parallel with the surface plate over a 100 mm length of the arbor to determine the amount of connecting rod twist.

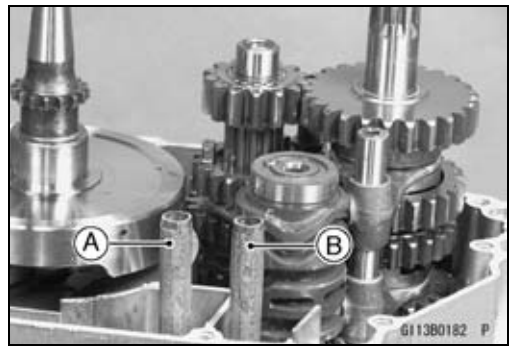
★If connecting rod twist exceeds the service limit, the connecting rod must be replaced.

Connecting Rod Twist
Service Limit: TIR 0.2/100 mm (0.08/3.94 in.)

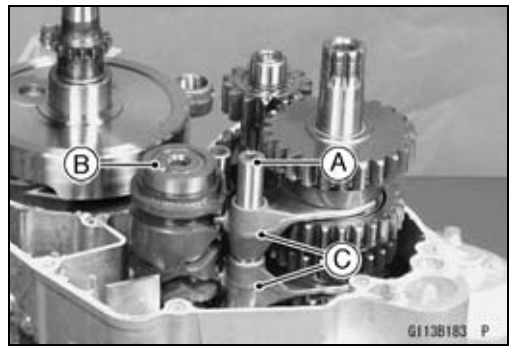
Transmission

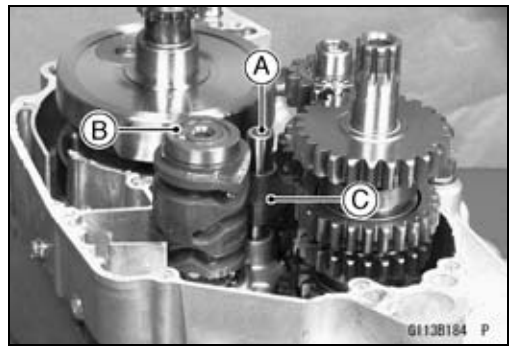
Transmission Shaft Removal

- Disassemble the crankcase halves (see Crankcase Disassembly).
- Pull out the oil screens, if fitted the screens at the right crankcase.
  Crank Room Side Oil Screen [A]
  Transmission Room Side Oil Screen [B]



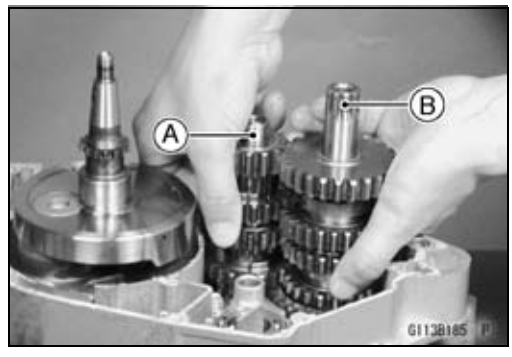
- Pull out the shift rods [A] allowing the shift fork guide pins to free from the shift drum [B].
- Remove the shift forks [C].
- Remove the shift drum.





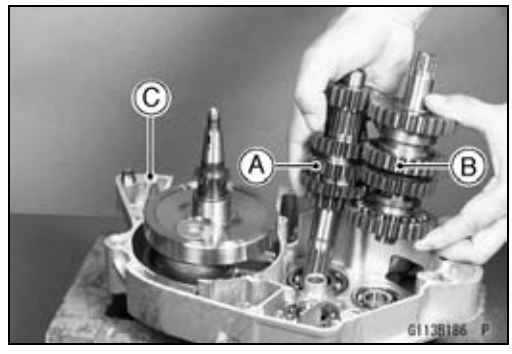
- Pull out the drive shaft [A] and output shaft [B] together with their gears meshed.

○1st gear of the output shaft is left for the crankcase.



Transmission Shaft Installation

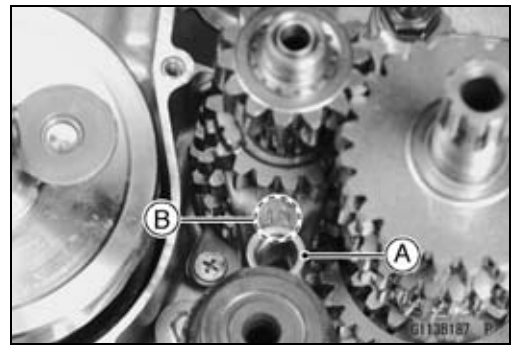
- Apply engine oil to the sliding portion of the transmission shaft, gears, and ball bearings.
- Install the drive shaft [A] and output shaft [B] in the right crankcase [C] with their gears meshed.
- Install the shift drum.



Transmission

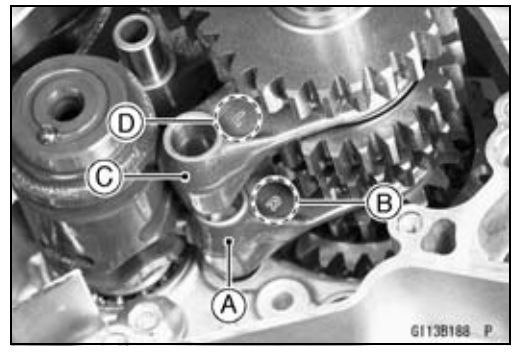
- Apply a small amount of engine oil to the shift fork fingers and fit each shift fork into the groove of the proper gear.
- The shift forks can be identified by their shape or mark. Install them noting the direction shown.

○The drive shaft shift fork [A] is the shortest, and install it with its mark “IN” [B] facing the engine left side.

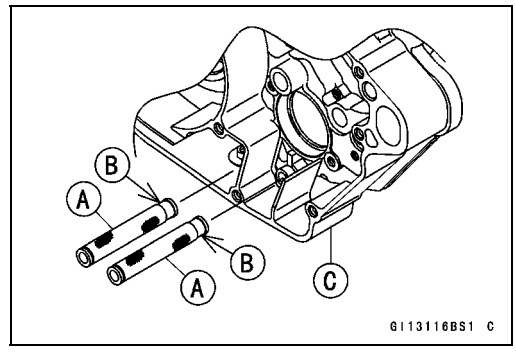


○Install the right output shaft shift fork [A] with its mark “R” [B] facing the engine right side.
○Install the left output shaft shift fork [C] with its mark “L” [D] facing the engine left side.

- Fit each shift fork guide pin into the corresponding groove in the shift drum.
- Apply a small amount of engine oil to the shift rods and slide them into the shift forks.



- Install the oil screens [A] as shown.
  Longer Outcrop of Pipe [B]
  Right Crankcase [C]
- Assembly the crankcase (see Crankcase Assembly).



Transmission Shaft Disassembly

- Remove the transmission shafts.
- Remove the circlips, washers, then gears.

Special Tool - Outside Circlip Pliers: 57001-144

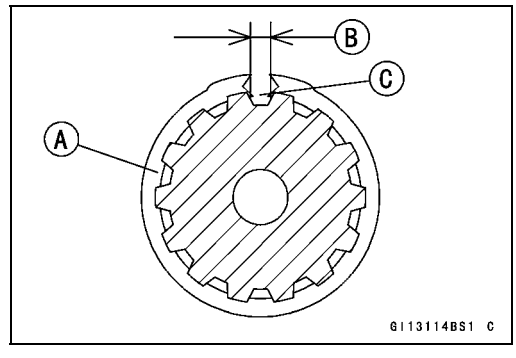
- Do not reuse the removed circlips.

Transmission Shaft Assembly

- Apply engine oil liberally to the transmission shaft, gears and bearings.
- Replace any circlips that were removed with new ones.

○Always install the circlips [A] so that the opening [B] is aligned with a spline groove [C], and install toothed washers. To install a circlip without damage, first fit the circlip onto the shaft expanding it just enough to install it, and then use a suitable gear to push the circlip into place.

Special Tool - Outside Circlip Pliers: 57001-144



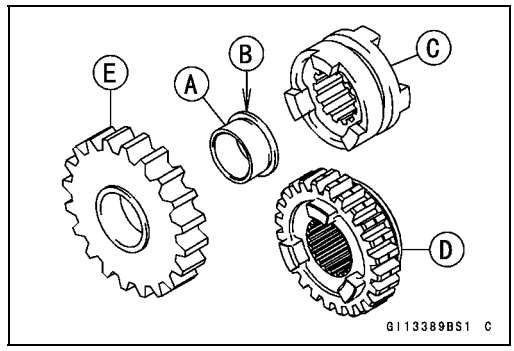
- The drive shaft gears can be identified by size; the smallest diameter gear is 1st gear, and the largest is 5th. Be sure that all parts are put back in the correct sequence, facing the proper direction, and that all circlips and the washers are properly in place.

Transmission

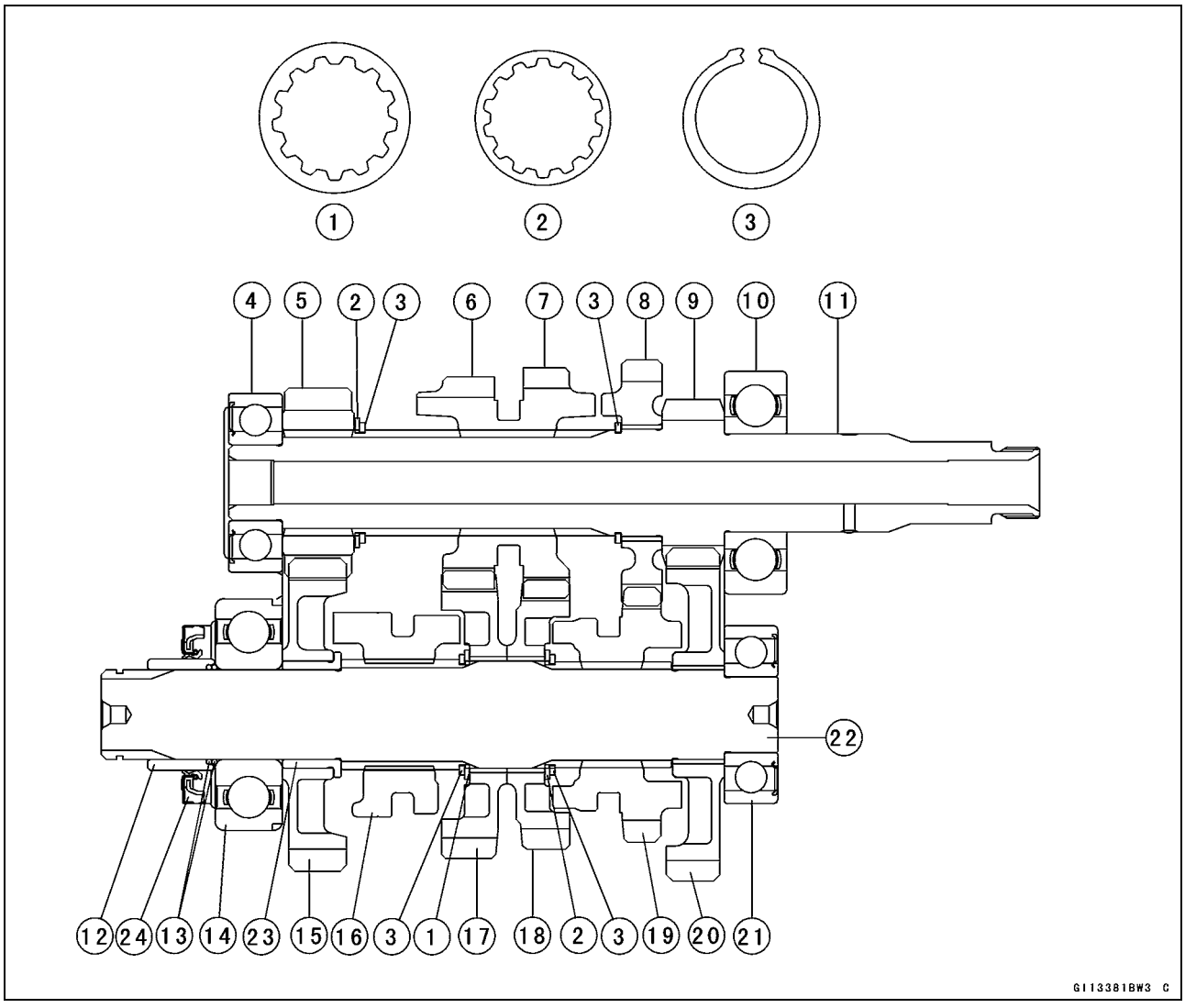
- The output shaft gears can be identified by size; the largest diameter gear is 1st gear, and the smallest is 5th. Be sure that all parts are put back in the correct sequence, facing the proper direction, and that all circlips and washers are properly in place.

○Install the collar [A] with the flange [B] facing toward the shifter [C] side. (KX250T6F)

○Install the collar [A] with the flange [B] facing toward the 4th gear [D] side. (KX250T7F ~)
2nd Gear (output) [E]



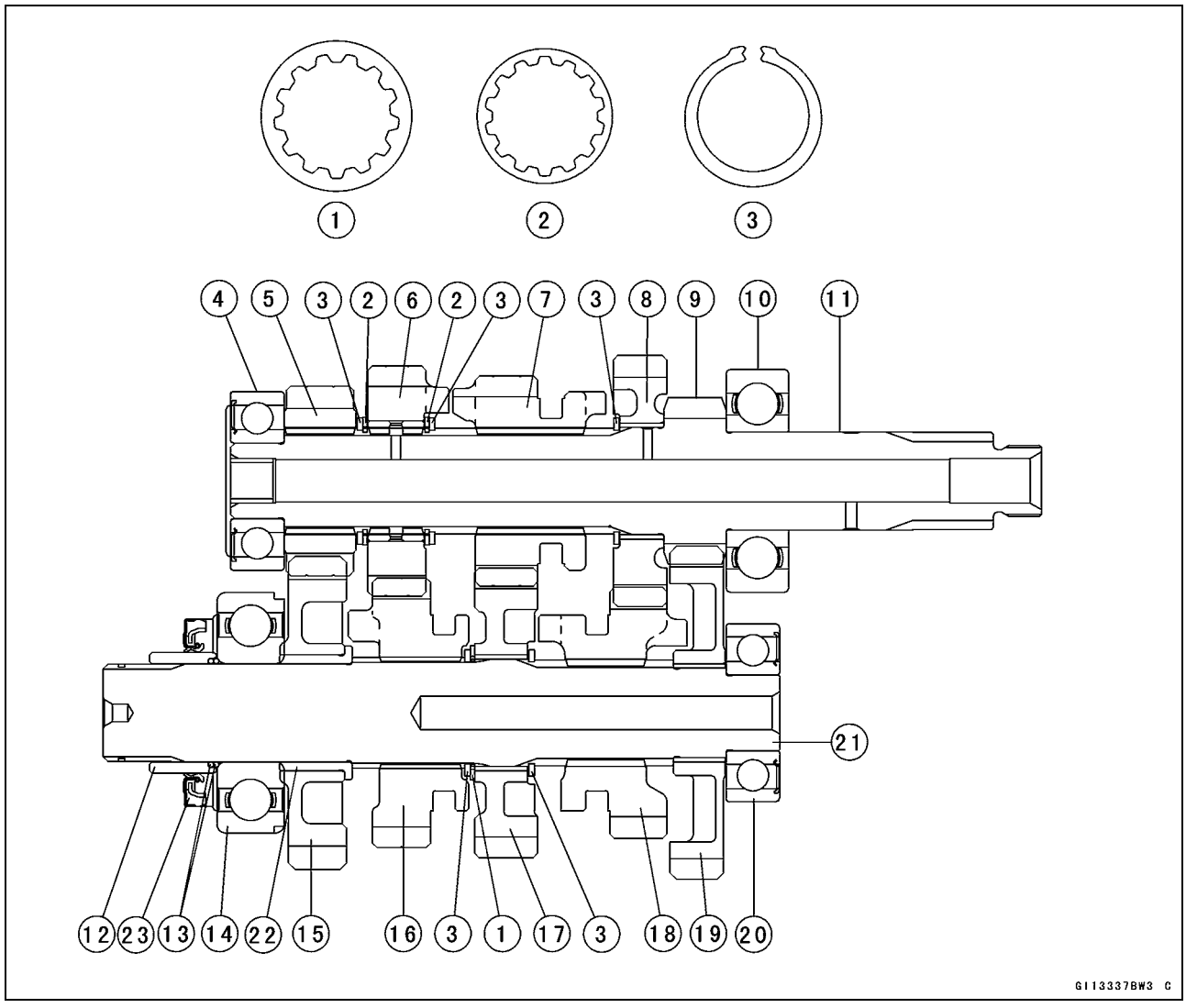
KX250T6F



1. Toothed Washer (large)
2. Toothed Washer (small)
3. Circlip
4. Ball Bearing (one side sealed)
5. 2nd Gear (14T)
6. 3rd Gear (18T)
7. 4th Gear (20T)
8. 5th Gear (19T)
9. 1st Gear (14T)
10. Ball Bearing
11. Drive Shaft
12. Collar
13. O-rings (2)
14. Ball Bearing
15. 2nd Gear (25T)
16. Shifter (2nd-3rd, four dog recesses faces right)
17. 3rd Gear (26T)
18. 4th Gear (24T)
19. 5th Gear (20T)
20. 1st Gear (30T)
21. Ball Bearing (One side sealed)
22. Output Shaft
23. Collar
24. Oil Seal

Transmission

KX250T7F ~



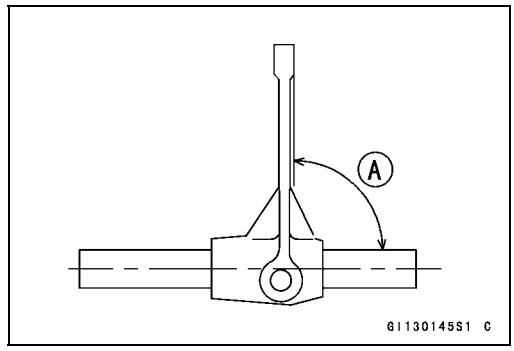
1. Toothed Washer (large)
2. Toothed Washer (small)
3. Circlip
4. Ball Bearing (one side sealed)
5. 2nd Gear (14T)
6. 4th Gear (20T)
7. 3rd Gear (18T)
8. 5th Gear (22T)
9. 1st Gear (14T)
10. Ball Bearing
11. Drive Shaft
12. Collar
13. O-rings (2)
14. Ball Bearing
15. 2nd Gear (25T)
16. 4th Gear (24T)
17. 3rd Gear (26T)
18. 5th Gear (20T)
19. 1st Gear (30T)
20. Ball Bearing (One side sealed)
21. Output Shaft
22. Collar
23. Oil Seal

- Check each gear spins or slides freely on the transmission shaft without binding after assembly.

Transmission

Shift Fork Bending Inspection

- Visually inspect the shift forks, and replace any fork that is bent. A bent fork may cause difficulty in shifting, or allow the transmission to jump out of gear when under power.
  90° [A]



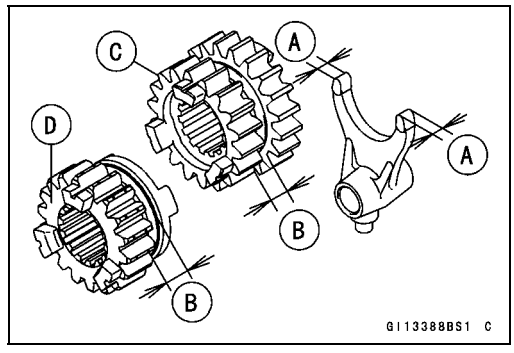
Shift Fork/Gear Groove Wear Inspection

- Measure the thickness [A] of the shift fork ears, and measure the width [B] of the gear grooves (with which the fork engages).
  [C] KX250T6F
  [D] KX250T7F ~

Shift Fork Ear Thickness
Standard: 4.9 ~ 5.0 mm (0.1929 ~ 0.1969 in.)
Service Limit: 4.8 mm (0.1890 in.)

Gear Groove Width
Standard: 5.05 ~ 5.15 mm (0.1988 ~ 0.2028 in.)
Service Limit: 5.25 mm (0.2070 in.)

★If the thickness of a shift fork ear is less than the service limit, the shift fork must be replaced.
★If the gear groove is worn exceeding the service limit, the gear must be replaced.



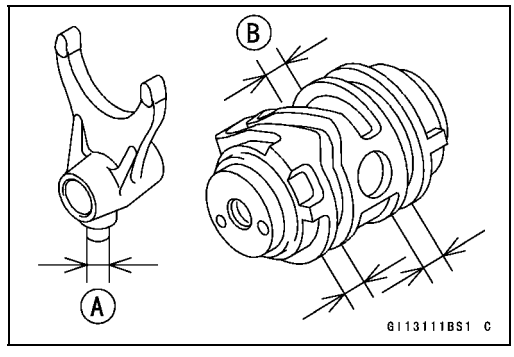
Shift Fork Guide Pin/Shift Drum Groove Wear Inspection

- Measure the diameter [A] of each shift fork guide pin, and measure the width [B] of each shift drum groove.

Shift Fork Guide Pin Diameter
Standard: 5.9 ~ 6.0 mm (0.2323 ~ 0.2362 in.)
Service Limit: 5.8 mm (0.2283 in.)

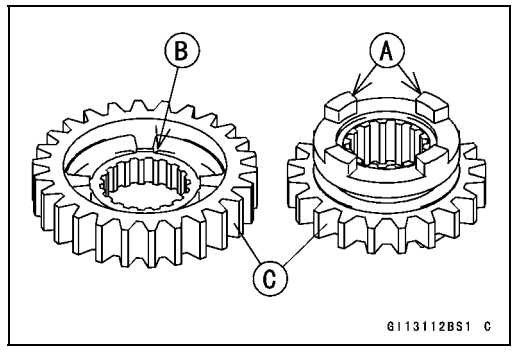
Shift Drum Groove Width
Standard: 6.05 ~ 6.20 mm (0.2382 ~ 0.2441 in.)
Service Limit: 6.3 mm (0.2480 in.)

★If the guide pin on any shift fork is less than the service limit, the fork must be replaced.
★If any shift drum groove is worn exceeding the service limit, the drum must be replaced.



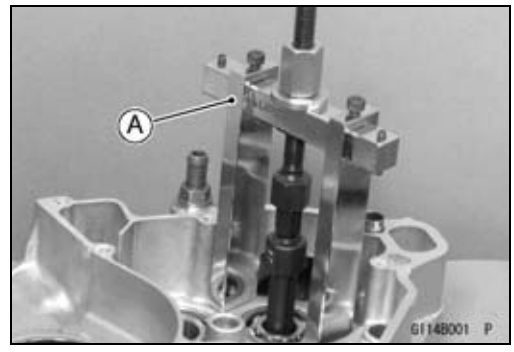
Gear Damage Inspection

- Visually inspect the gear dogs [A] and gear dog holes [B].
★Replace any damaged gears or gears with excessively worn dogs or dog holes.
- Visually inspect the gear teeth [C] on the transmission gears.
★Replace lightly damaged gear teeth with an oilstone. The gear must be replaced if the teeth are badly damaged.
★When gear is repaired or replaced, the driving gear should also be inspected and repaired or replaced if necessary.



Bearings/Oil Seals

Bearing Replacement



CAUTION

Do not remove the ball bearings unless it is necessary. Removal may damaged them.

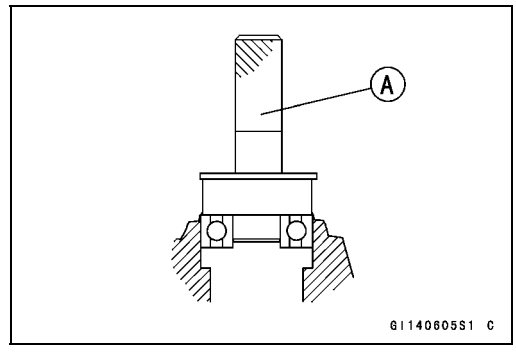
● Remove the ball bearing and/or needle bearing outer race using a press or suitable bearing remover [A].

NOTE

○*In the absence of the above mentioned tools, satisfactory results may be obtained by heating the case to approximately 93°C (200°F) max, and tapping the bearing in or out.*

CAUTION

Do not heat the case with a torch. This will warp the case. Soak the case in oil and heat the oil.



● Install the new bearing until its outer race stops at the bottom of the case using a press and the bearing driver set [A].

Special Tool - Bearing Driver Set: 57001-1129

Bearing Inspection

CAUTION

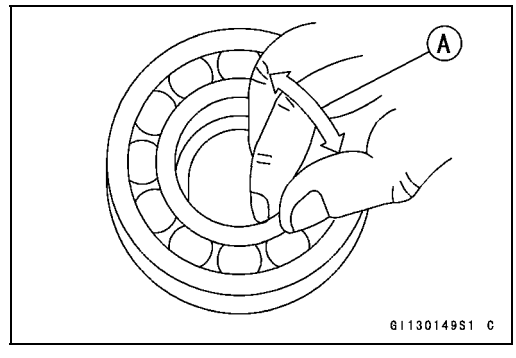
Do not remove the bearings for inspection. Removal may damage them.

● Inspect the ball bearings.

○Since the ball bearings are made to extremely close tolerances, the wear must be judged by feel rather than measurement. Clean each bearing in a high-flash point solvent, dry it (do not spin the bearing while it is dry), and oil it with engine oil to it.

○Spin [A] the bearing by hand to check its condition.

★If the bearing is noisy, does not spin smoothly, or has any rough spots, replace it.



Bearings/Oil Seals

● Check the needle bearing.
○The rollers in a needle bearing normally wear very little, and wear is difficult to measure. Instead of measuring, inspect the bearing for abrasion, color change, or other damage.
★If there is any doubt as to the condition of a needle bearing, replace it.

Oil Seal Inspection

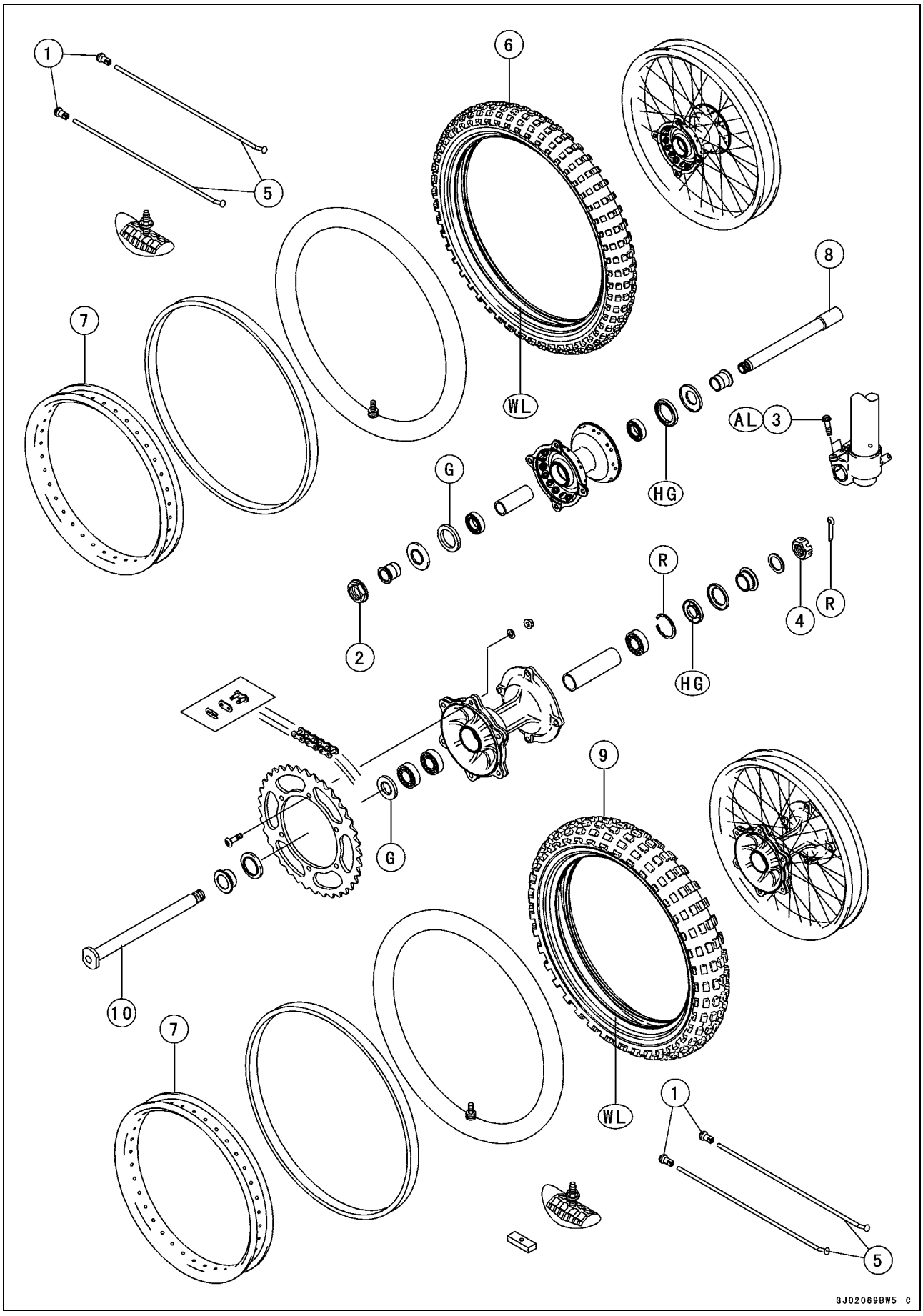
★Replace the oil seal if the lips are deformed, discolored (indicating that the rubber has deteriorated), hardened or otherwise damaged.

Wheels/Tires

Table of Contents

Exploded View 10-2
Specifications 10-4
Special Tools 10-5
Wheels (Rims) 10-6
  Front Wheel Removal 10-6
  Front Wheel Installation 10-6
  Rear Wheel Removal 10-7
  Rear Wheel Installation 10-8
  Wheels Inspection 10-9
  Spoke Tightness Inspection 10-9
  Rim Runout Inspection 10-9
  Axle Inspection 10-9
Tires 10-10
  Tire Removal 10-10
  Tire Installation 10-11
  Air Pressure Inspection/Adjustment 10-12
Hub Bearings 10-13
  Hub Bearing Removal 10-13
  Hub Bearing Installation 10-13
  Hub Bearing Inspection 10-13

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Spoke Nipples	2.2	0.22	19 in·lb	
2	Front Axle Nut	79	8.0	58	
3	Front Axle Clamp Bolts	20	2.0	14.5	AL
4	Rear Axle Nut	108	11	80	

5. Spokes
6. Front Tire
7. Rims
8. Front Axle
9. Rear Tire
10. Rear Axle

AL: Tighten the two clamp bolts alternately two times to ensure even tightening torque.
HG: Apply High-Temperature Grease.
WL: Apply soap and water solution, or rubber lubricant.

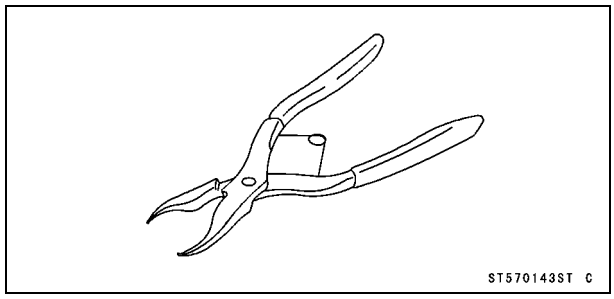
Specifications

Item	Standard	Service Limit
Wheels (Rims)		
Rim Size:		
Front	21 × 1.60	– – –
Rear	19 × 1.85	– – –
Rim Runout:		
Axial	TIR 1.0 mm (0.04 in.) or less	TIR 2 mm (0.08 in.)
Radial	TIR 1.0 mm (0.04 in.) or less	TIR 2 mm (0.08 in.)
Axle Runout/ 100 mm	TIR 0.1 mm (0.004 in.)	TIR 0.2 mm (0.008 in.)
Tires Air Pressure		
Front and Rear	100 kPa (1.0 kgf/cm², 14 psi)	– – –
Tires		
Standard Tire:		
Front:		
Size	80/100-21 51M	– – –
Make	BRIDESTONE	
Type	M401, Tube (KX250T6F ~ T7F) M403, Tube (KX250T8F) (EUR) M201, Tube	
Rear:		
Size	100/90-19 57M	– – –
Make	BRIDESTONE	
Type	M402, Tube (KX250T6F ~ T7F) M404, Tube (KX250T8F) (EUR) M202 Tube	

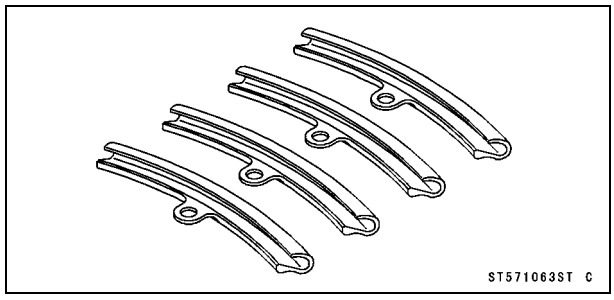
EUR: Europe Model

Special Tools

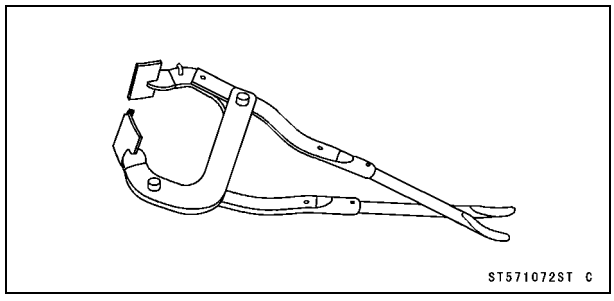
Inside Circlip Pliers:
57001-143



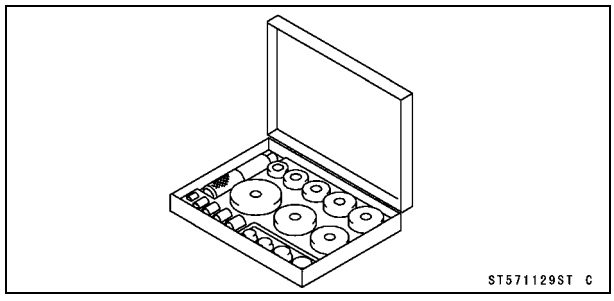
Rim Protector:
57001-1063



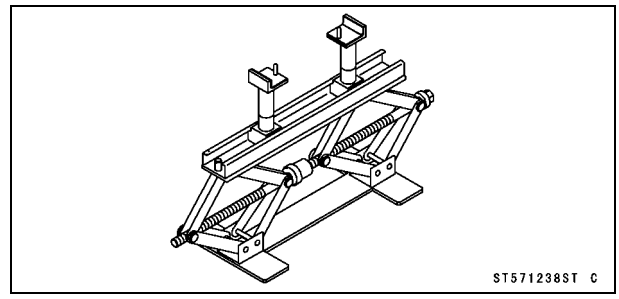
Bead Breaker Assembly:
57001-1072



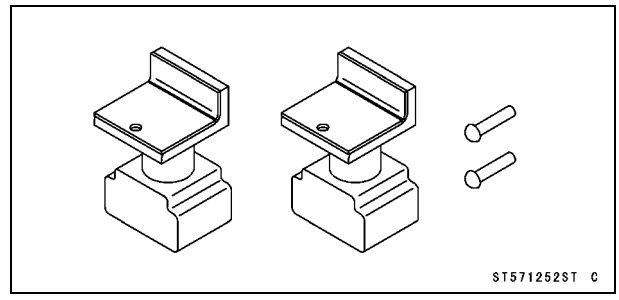
Bearing Driver Set:
57001-1129



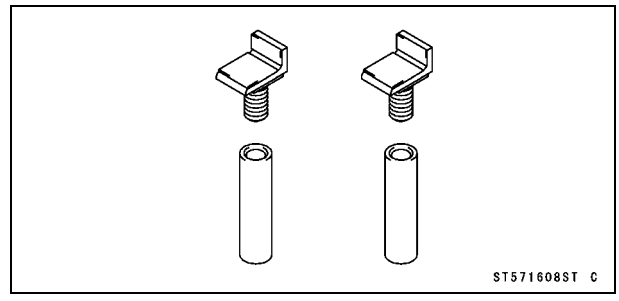
Jack:
57001-1238



Attachment Jack:
57001-1252



Jack Attachment:
57001-1608

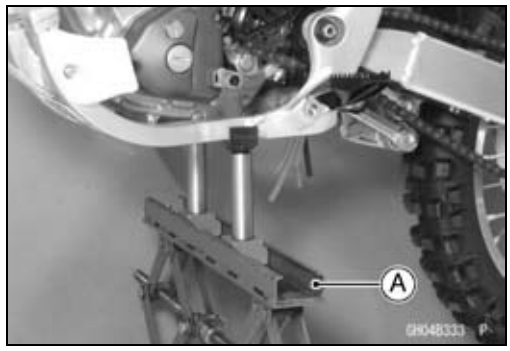


Wheels (Rims)

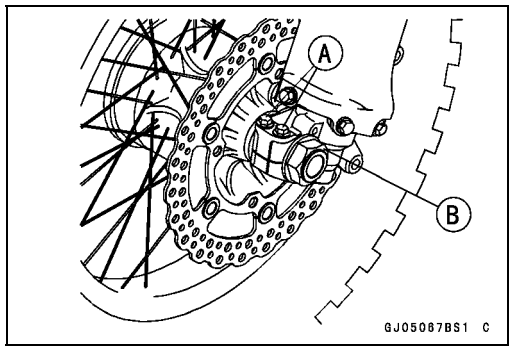
Front Wheel Removal

- Using the jack [A] under the frame, and stabilize the motorcycle.

Special Tools - Jack: 57001-1238
Jack Attachment: 57001-1252 or 57001 -1608

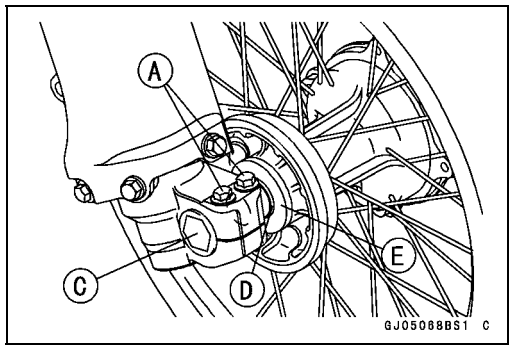


- Loosen the left and right axle clamp bolts [A].
- Unscrew the axle nut [B].
- Place a commercially available jack under the engine to raise the front wheel off the ground.
- Remove the axle [C], and pull out the wheel. Take off the collars [D] and caps [E] from each side of the front hub.



CAUTION

Do not lay the wheel on the ground with the disc facing down. This can damage or warp the disc. Place blocks under the wheel so the disc does not touch the ground.

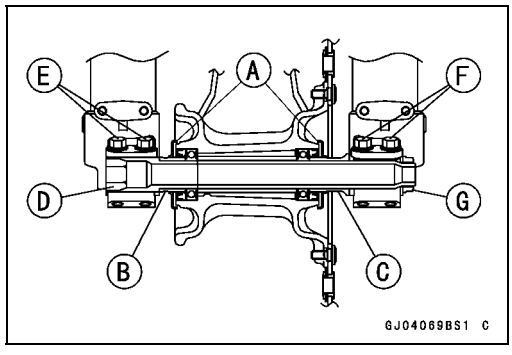


- Insert a wood wedge between the disc brake pads. This prevents them from being moved out of their proper position, should the brake lever be squeezed accidentally.

Front Wheel Installation

- Apply grease to the seals.
- Fit the projection on the cap to the groove on the collar.
- Install the caps [A], collars on the right (shorter collar [B]) and left (longer collar [C]) side of the hub.
- Insert the axle [D] from right side.
- Screw the right [E] axle clamp bolts temporally.
- Tighten the axle nuts [G].
- Tighten the left axle clamp bolts [F].

Torque - Front Axle: 79 N·m (8.0 kgf·m, 58 ft·lb)
Left Axle Clamp Bolts: 20 N·m (2.0 kgf·m, 14.5 ft·lb)

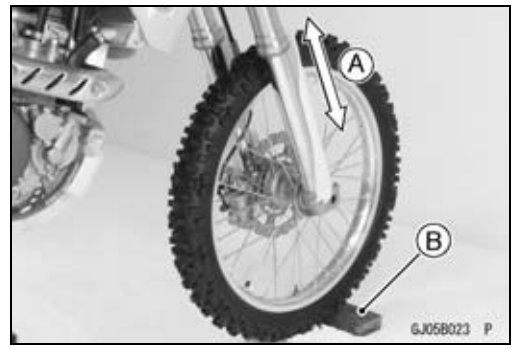


NOTE

○*Tighten the two clamp bolts alternately two times to ensure even tightening torque.*

Wheels (Rims)

- Remove the jack.
- Before tightening the clamp bolts on the right fork leg, pump the forks up and down [A] 4 or 5 times to allow the right fork leg to find a neutral position on the front axle.



NOTE

○*Do not apply the front brake during this process to stop the motorcycle from rolling forward. Put a block [B] in front of the wheel to stop it from moving.*

- Tighten the right axle clamp bolts.

Torque - Right Axle Clamp Bolts: 20 N·m (2.0 kgf·m, 14.5 ft·lb)

NOTE

○*Tighten the two clamp bolts alternately two times to ensure even tightening torque.*

- Check the front brake for good braking power and no brake drag.

⚠ WARNING

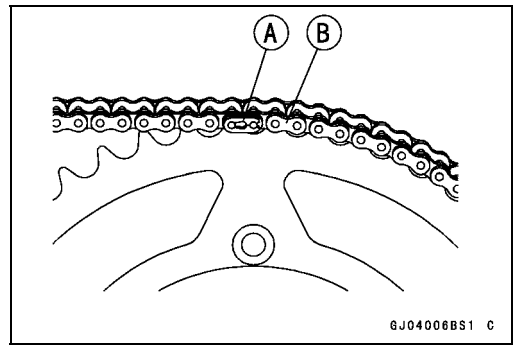
Do not attempt to drive the motorcycle until a full brake lever is obtained by pumping the brake lever until the pads are against the disc. The brake will not function on the first application of the lever if this is not done.

Rear Wheel Removal

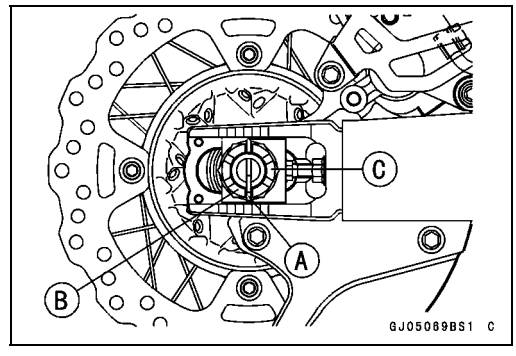
- Using the jack under the frame so that the rear wheel is raised off the ground.

Special Tools - Jack: 57001-1238
Jack Attachment: 57001-1252 or 57001 -1608

- Remove the clip [A] from the master link using pliers, and free the drive chain [B] from the rear sprocket.

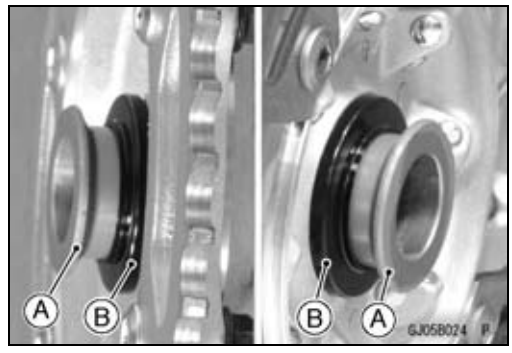


- Remove
  Cotter Pin [A]
  Axle Nut [B]
- Pull out the axle [C].
- Move the rear wheel back with the rear caliper installed.



Wheels (Rims)

- Take off the collars [A] and caps [B] from the each side of the rear hub.



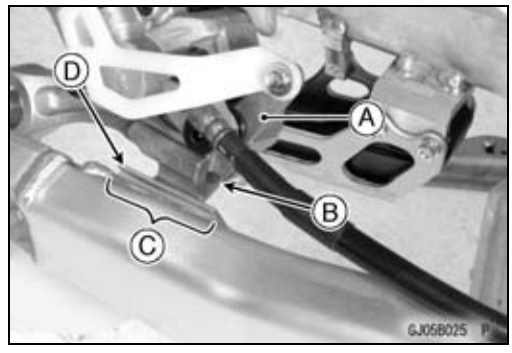
CAUTION

Do not lay the wheel on the ground with the disc facing down. This can damage or warp the disc. Place blocks under the wheel so the disc does not touch the ground.

- Insert a wood wedge between the brake pads. This prevents them from being moved out of their proper position, should the brake pedal be squeezed accidentally.

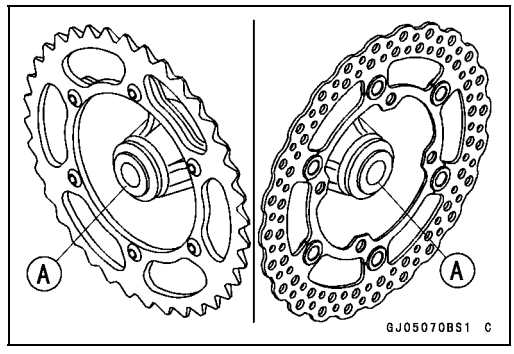
Rear Wheel Installation

- Fit the brake holder stop [A] with the stop grooves [B] against the swingarm stop space [C] with the stop projection [D].

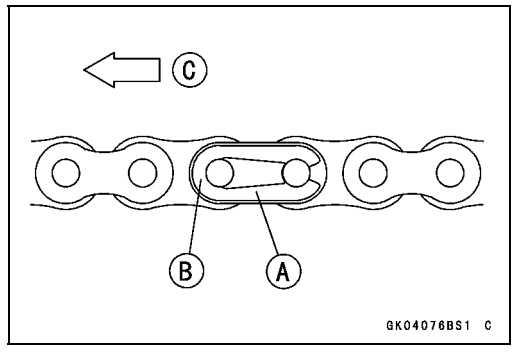


- Fit the projection on the cap to the groove on the collar.
- Install the collars [A] on the left and right side of the hub.

○The collars are identical.



- Install the drive chain. Install the master link clip [A] so that the closed end [B] of the "U" points in the direction of chain rotation [C].

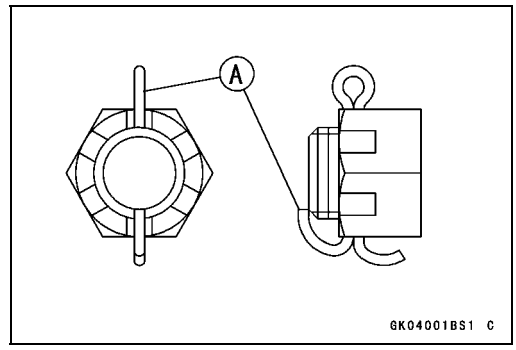


Wheels (Rims)

- Check the drive chain slack (see Final Drive chapter).
- Tighten the axle nut.

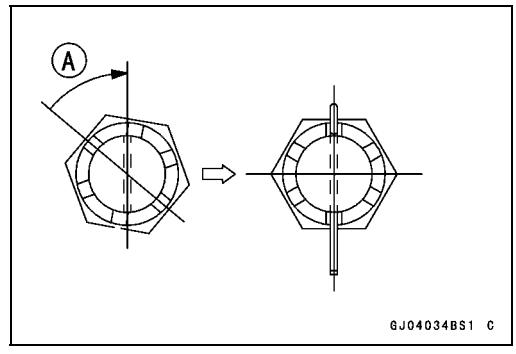
Torque - Rear Axle Nut: 108 N·m (11 kgf·m, 80 ft·lb)

- Install the new cotter pin [A] and spread its end.



NOTE

○*When inserting the cotter pin, if the slots in the nut do not align with the cotter pin hole in the axle shaft, tighten the nut clockwise [A] up to next alignment.*
○*It should be within 30 degree.*
○*Loosen one and tighten again when the slot goes past the nearest hole.*



⚠ WARNING

If the axle nut is not securely tightened, or the cotter pin is not installed, an unsafe riding condition may result.

- Check the rear brake for good braking power and no brake drag.

⚠ WARNING

Do not attempt to drive the motorcycle until a full brake pedal is obtained by pumping the brake pedal until the pads are against the disc. The brake will not function on the first application of the pedal if this is not done.

Wheels Inspection

- Refer to the Wheel Bearing Inspection in the Periodic Maintenance chapter.

Spoke Tightness Inspection

- Refer to the Spoke Tightness Inspection in the Periodic Maintenance chapter.

Rim Runout Inspection

- Refer to the Rim Runout Inspection in the Periodic Maintenance chapter.

Axle Inspection

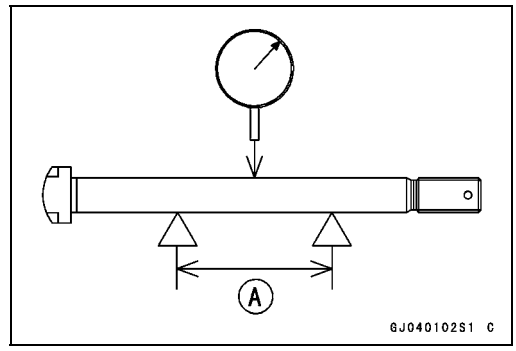
- Visually inspect the front and rear axle for damages.

★If the axle is damaged or bent, replace it.

- Place the axle in V blocks that are 100 mm (3.937 in.) [A] apart, and set a dial gauge on the axle at a point halfway between the blocks. Turn the axle to measure the runout. The difference between the highest and lowest dial readings is the amount of runout.

★If the runout exceeds the service limit, replace the axle.

Axle Runout/100 mm (3.937 in.)
Standard: TIR 0.1 mm (0.004 in.) or less
Service Limit: TIR 0.2 mm (0.008 in.)



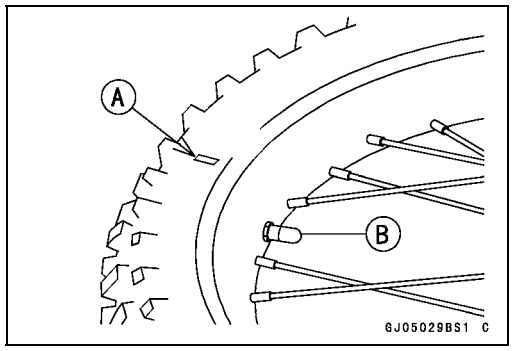
Tires

Tire Removal

CAUTION

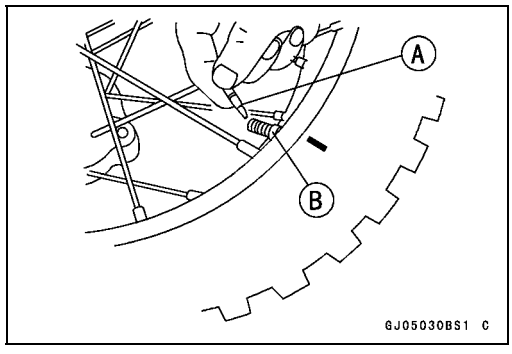
Do not lay the wheel on the ground with the disc facing down. This can damage or warp the disc. Place blocks under the wheel so the disc does not touch the ground.

- Remove the wheel from the motorcycle (see Wheels Removal).
- To maintain front wheel balance, mark [A] the valve stem position on the tire with chalk so that the tire can be reinstalled in the same position.
- Remove the valve cap [B].



- Take out the valve core [A] to let out the air.
- Remove the valve stem nut [B].

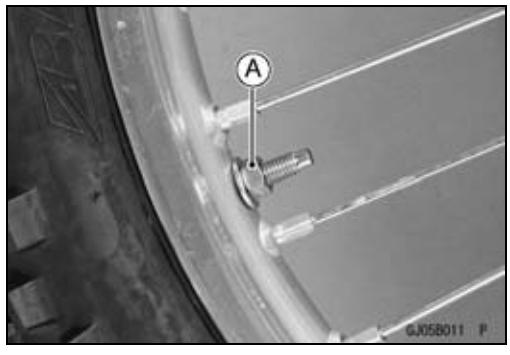
○When handling the rim, be careful not to damage the rim flanges.



- Loosen the bead protector nut [A].
- Lubricate the tire beads and rim flanges on both sides with a soap and water solution or rubber lubricant. This helps the tire beads slip off the rim flanges.

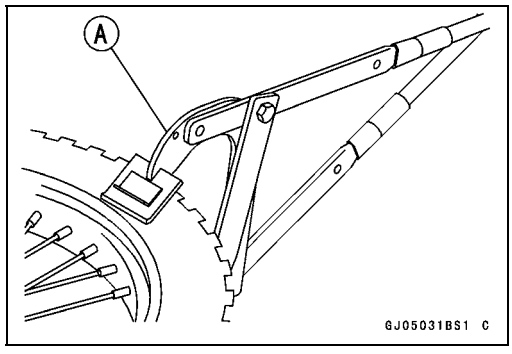
CAUTION

Never lubricate with mineral oil (engine oil) or gasoline because they will cause deterioration of the tire.



- Break the beads away from both sides of the rim with the bead breaker [A].

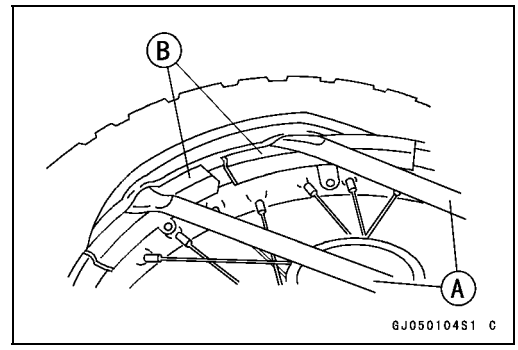
Special Tool - Bead Breaker Assembly: 57001-1072



Tires

● Step on the side of the tire opposite valve stem, pry the tire off the rim with the tire iron [A] of the bead breaker protecting the rim with rim protectors [B].

Special Tools - Rim Protector: 57001-1063
Bead Breaker Assembly: 57001-1072



CAUTION

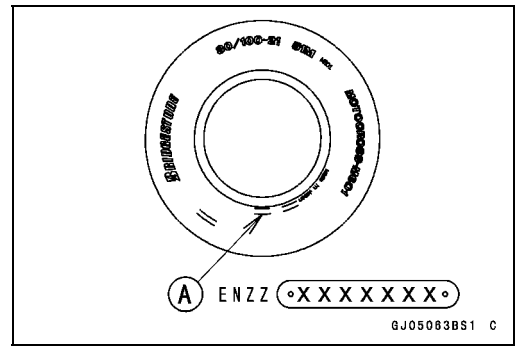
Take care not to inset the tire irons so deeply that the tube gets damaged.

● Remove the bead protector and tube when one side of the tire is pried off.
● Pry the tire off the rim.

Tire Installation

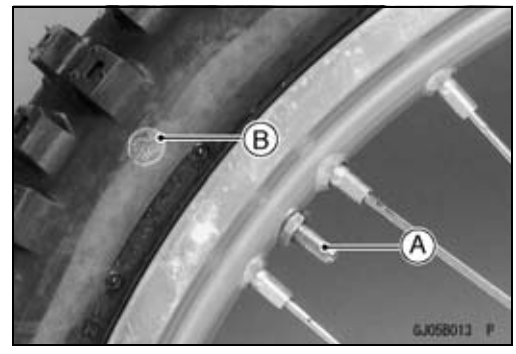
NOTE

○*The Tires should be installed so that the ID serial NO. [A] faces to left side.*



● Inspect the rim and tire, and replace them if necessary.
● Install the tube band onto the rim.
● Apply a soap and water solution, or rubber lubricant to the rim flange and tire beads.

● Position the front tire on the rim so that the valve [A] is at the tire balance mark [B] (the chalk mark made during removal (see Tire Removal).
○The new tire is no marked.
● Insert the valve stem into the rim, and screw the nut on loosely.
● Fit the rim protectors and use tire irons to install the tire bead.



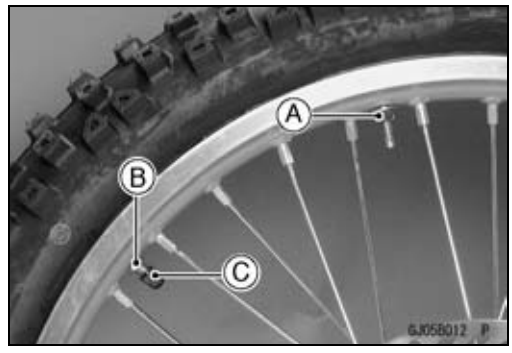
NOTE

○*To prevent rim damage, be sure to place the rim protectors at any place the tire irons are applied.*

● Pry one side of the tire back onto the rim. Fit the bead protector into the tire.
● Pry the other side of the tire onto the rim, starting at the opposite side the valve.
○Take care not to insert the tire irons so deeply that the tube is damaged.
● Install the other side of the tire bead onto the rim in the same manner.
● Check that the tube is not pinched between the tire and rim.

Tires

- Tighten the bead protector nut [A] and valve stem nut [B].
- Check and adjust the air pressure after installing.
- Put on the valve cap [C].



Air Pressure Inspection/Adjustment

- Refer to the Air Pressure Inspection/Adjustment in the Periodic Maintenance chapter.

Hub Bearings

Hub Bearing Removal

● Remove the wheel (see Wheel Removal).

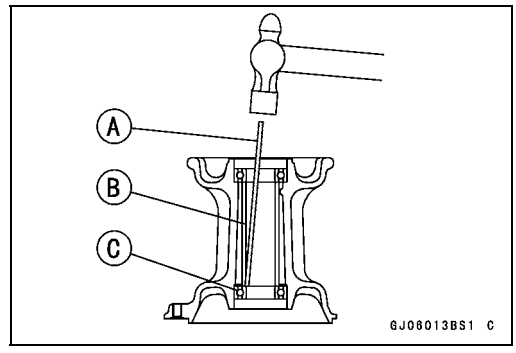
CAUTION

Do not lay the wheel on the ground with the disc facing down. This can damage or warp the disc. Place blocks under the wheel so that the disc does not touch the ground.

● Remove the oil seals and circlip (rear wheel only).

Special Tool - Inside Circlip Pliers: 57001-143

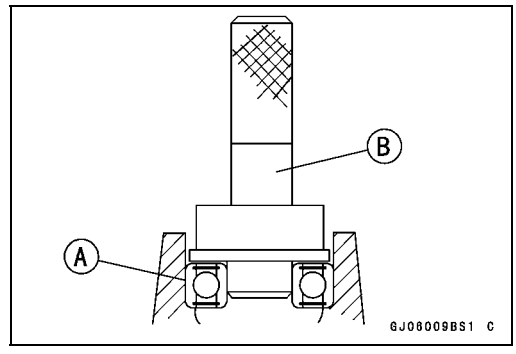
● Remove the hub bearing by tapping evenly around the bearing inner race as shown.
[A] Bar
[B] Distance Collar
[C] Hub Bearing



Hub Bearing Installation

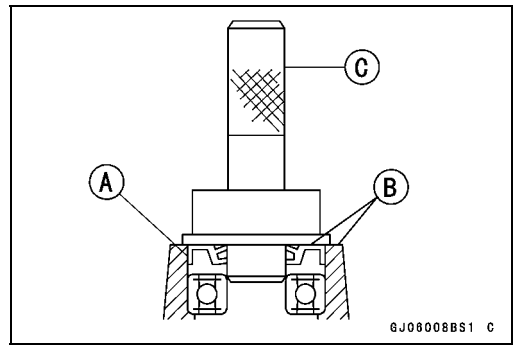
● Before installing the wheel bearings, blow any dirt or foreign particles out of the hub with compressed air to prevent contamination of the bearings.
● Replace the bearings [A] with new ones.
● Lubricate them and install them using the bearing driver set [B] so that the marked or shielded sides face out.
○Press in the bearings until they are bottomed.

Special Tool - Bearing Driver Set: 57001-1129



● Replace the circlip (rear wheel only) and oil seals with new ones.
● Press in the oil seals [A] so that the seal surface is flush [B] with the end of the hole.
● Apply high temperature grease to the oil seal lips.

Special Tool - Bearing Driver set: 57001-1129 [C]

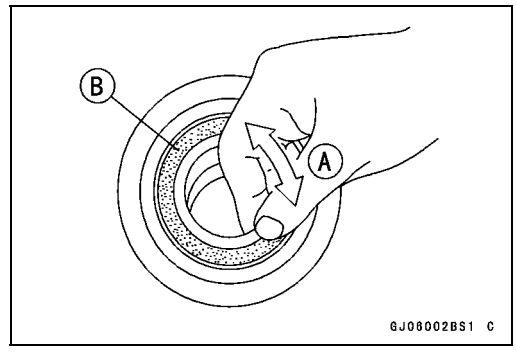


Hub Bearing Inspection

NOTE

○*It is not necessary to remove any bearings for inspection. If any bearings are removed, they will need to be replaced with new ones.*

● Spin [A] it by hand to check its condition.
★If it is noisy, does not spin smoothly, or has any rough spots, it must be replaced.
● Examine the bearing seal [B] for tears or leakage.
★If the seal is torn or is leaking, replace the bearing.



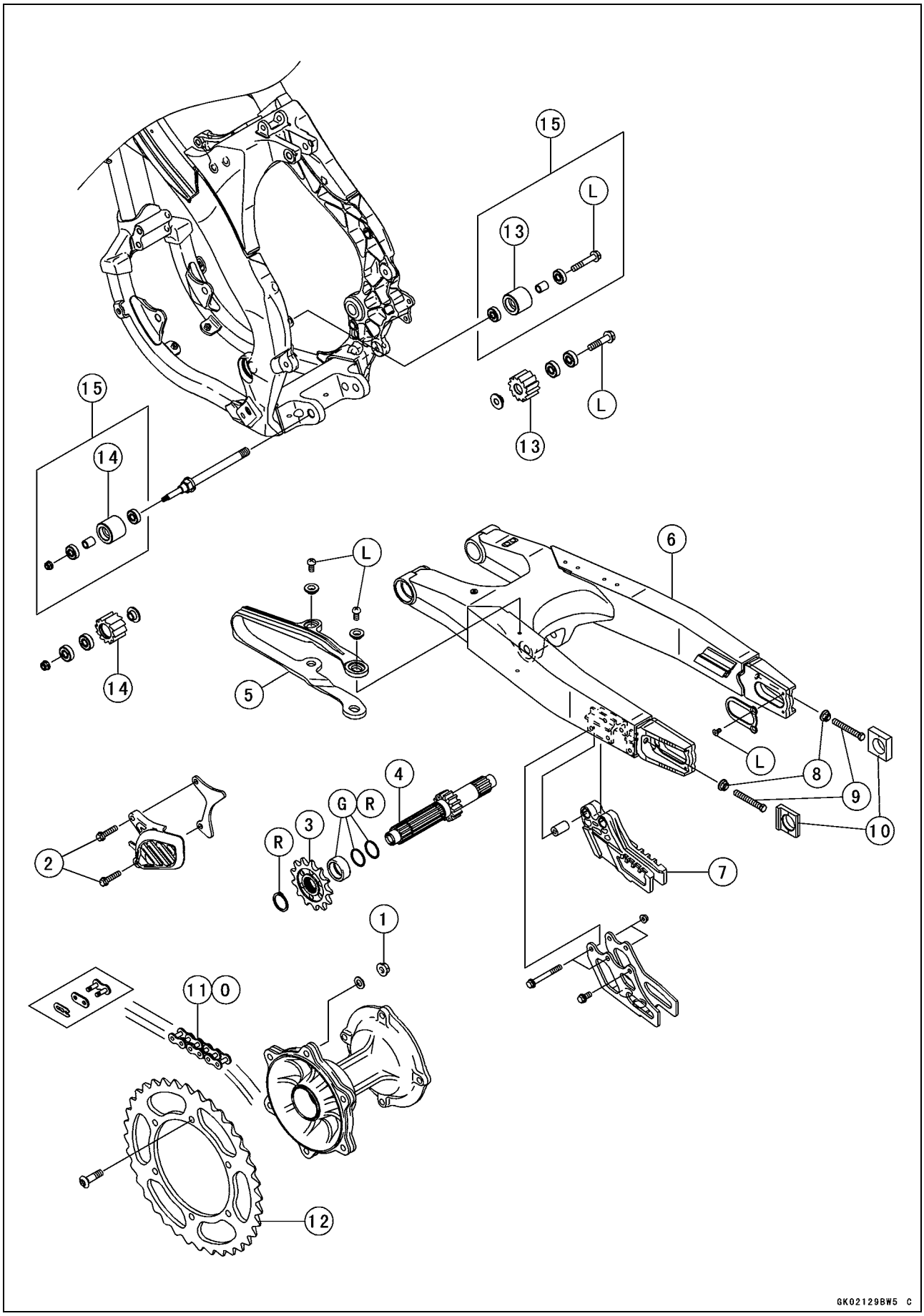
Final Drive

Table of Contents

Exploded View 11-2
Specifications 11-4
Special Tool 11-5
Drive Chain 11-6
- Drive Chain Slack Inspection 11-6
- Drive Chain Slack Adjustment 11-6
- Wheel Alignment Inspection 11-6
- Wheel Alignment Adjustment 11-6
- Drive Chain Wear Inspection 11-6
- Drive Chain Lubrication 11-6
- Drive Chain Removal 11-6
- Drive Chain Installation 11-6

Sprockets 11-8
- Engine Sprocket Removal 11-8
- Engine Sprocket Installation 11-8
- Rear Sprocket Removal 11-8
- Rear Sprocket Installation 11-9
- Sprocket Wear Inspection 11-9
- Rear Sprocket Warp (Runout) Inspection 11-9

Exploded View



Exploded View

No	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Rear Sprocket Nuts	34	3.5	25	
2	Engine Sprocket Cover Bolts	9.8	1.0	87 in·lb	

3. Engine Sprocket
4. Output Shaft
5. Chain Slipper
6. Swingarm
7. Chain Guide
8. Chain Adjuster Locknut
9. Chain Adjusting Bolt
10. Chain Adjuster
11. Drive Chain
12. Rear Sprocket
13. Upper Chain Guide Roller
14. Lower Chain Guide Roller
15. KX250T6F

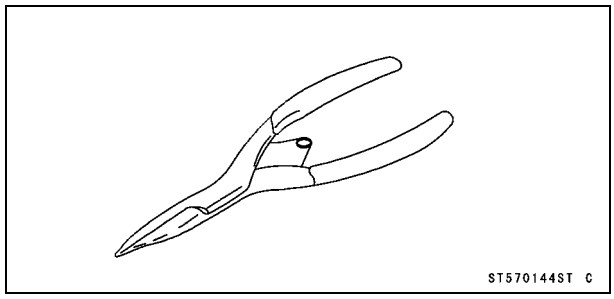
G: Apply grease.
L: Apply a non-permanent locking agent.
O: Apply oil.
R: Replacement Parts

Specifications

Item	Standard	Service Limit
Drive Chain		
Chain Slack	52 ~ 58 mm (2.05 ~ 2.28 in.)	– – –
Chain 20-link Length	317.5 ~ 318.2 mm (12.50 ~ 12.53 in.)	323 mm (12.72 in.)
Standard Chain:		
Make:	DAIDO	– – –
Type:	D.I.D 520DMA2	– – –
Length:	112 Links	– – –
Sprocket		
Rear Sprocket Warp (Runout)	TIR 0.4 mm (0.016 in.) or less	TIR 0.5 mm (0.020 in.)

Special Tool

Outside Circlip Pliers:
57001-144



Drive Chain

Drive Chain Slack Inspection

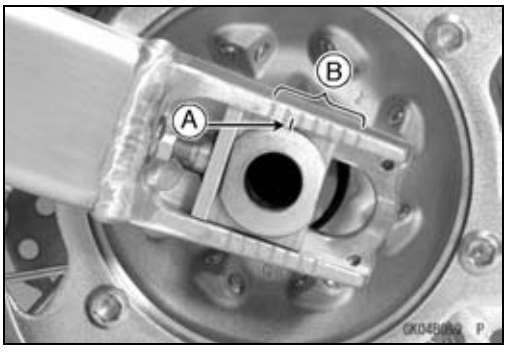
- Refer to the Drive Chain Slack Inspection in the Periodic Maintenance chapter.

Drive Chain Slack Adjustment

- Refer to the Drive Chain Slack Adjustment in the Periodic Maintenance chapter.

Wheel Alignment Inspection

- Check that the rear end [A] of the left chain adjuster aligns with the same swing arm mark [B] as the right chain adjuster.



⚠ WARNING

Misalignment of the wheel will result in abnormal wear, and may result in an unsafe riding condition.

Wheel Alignment Adjustment

This procedure is the same as Drive Chain Slack Adjustment.

- Refer to the Drive Chain Slack Adjustment in the Periodic Maintenance chapter.

Drive Chain Wear Inspection

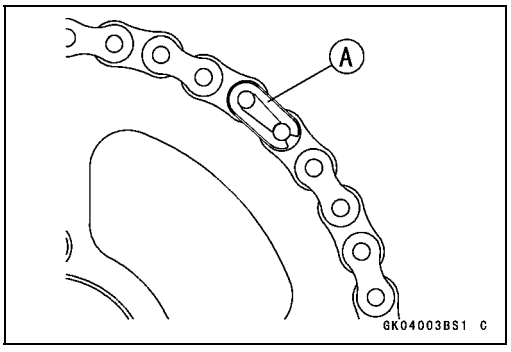
- Refer to the Drive Chain Wear Inspection in the Periodic Maintenance chapter.

Drive Chain Lubrication

- Refer to the Drive Chain Lubrication in the Periodic Maintenance chapter.

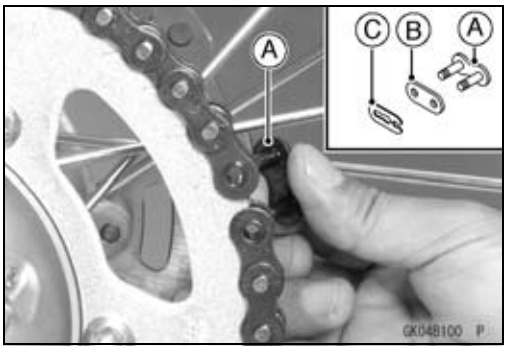
Drive Chain Removal

- Remove the clip [A] from the master link using pliers, and free the drive chain from the rear sprocket.
- Remove the drive chain from the chassis.



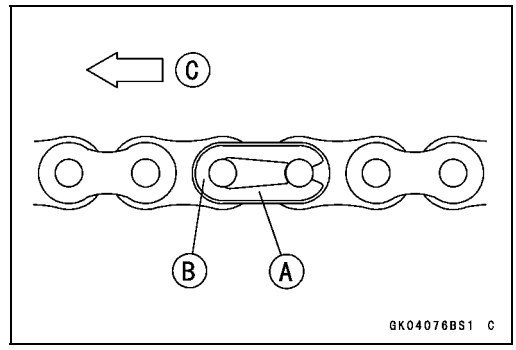
Drive Chain Installation

- Fit the drive chain back onto the sprockets with the ends at the rear sprocket.
- Install the master link [A] from the frame side.
- Install the link plate [B] so that the mark faces out.
  Clip [C]



Drive Chain

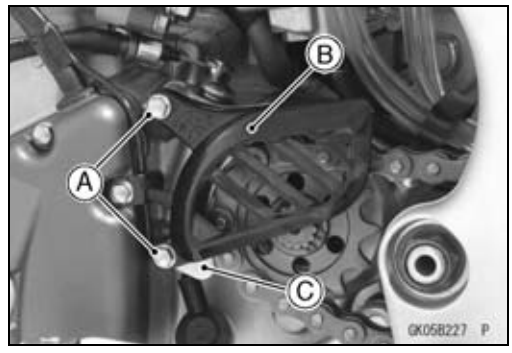
- Install the clip [A] so that the closed end [B] of the "U" pointed in the direction of chain rotation [C].
- Adjust the drive chain slack (see Drive Chain Slack Adjustment in the Periodic Maintenance chapter).



Sprockets

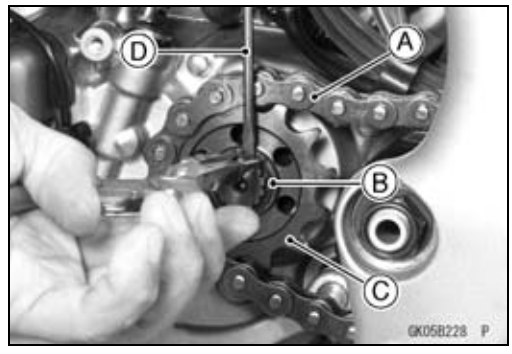
Engine Sprocket Removal

● Remove:
Engine Sprocket Cover Bolts [A]
Engine Sprocket Cover [B]
Drive Chain Guide [C]



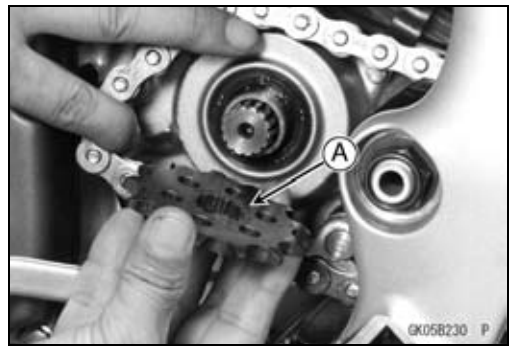
● Remove:
Drive Chain [A] (free of engine sprocket)
● Remove the circlip [B], and pull off the engine sprocket [C].
○If remove the circlip difficult, using the thin blade driver [D] as shown in the figure.

Special Tool - Outside Circlip Pliers: 57001-144



Engine Sprocket Installation

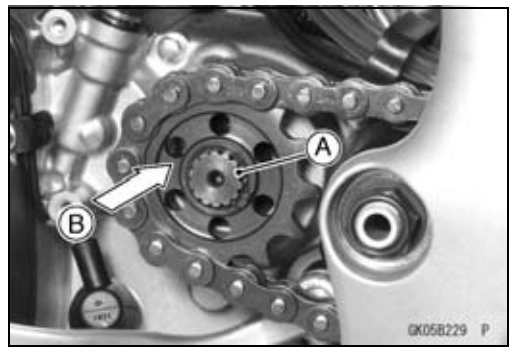
● Install the engine sprocket so that the flatten side [A] faces inside.



● Replace the circlip with a new one.
● Fit the circlip [A] into the groove on the output shaft.
○Pushing [B] the sprocket install the circlip.

Special Tool - Outside Circlip Pliers: 57001-144

Torque - Engine Sprocket Cover Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)



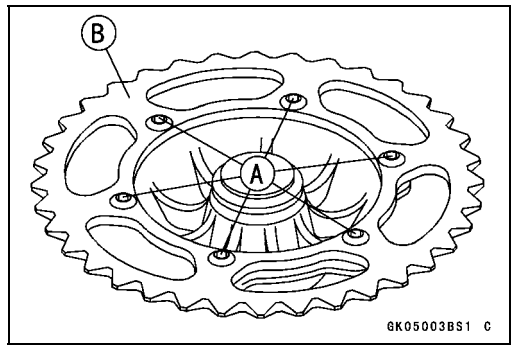
Rear Sprocket Removal

● Remove the rear wheel (see Rear Wheel Removal in the Wheels/Tires chapter).

CAUTION

Do not lay the wheel on the ground with the disc facing down. This can damage or warp the disc. Place blocks under the wheel so that the disc does not touch the ground.

● Unscrew the rear sprocket bolts [A], and remove the rear sprocket [B].

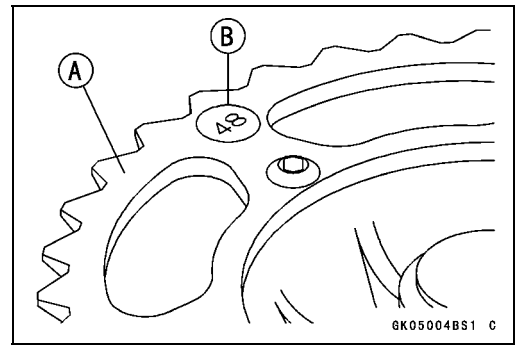


Sprockets

Rear Sprocket Installation

- Install the rear sprocket [A] so that the marked side [B] faces out.
- Install the rear sprocket bolts and tighten the nuts.

Torque - Rear Sprocket Nuts: 34 N·m (3.5 kgf·m, 25 ft·lb)



Sprocket Wear Inspection

- Refer to the Sprocket Wear Inspection in the Periodic Maintenance chapter.

Rear Sprocket Warp (Runout) Inspection

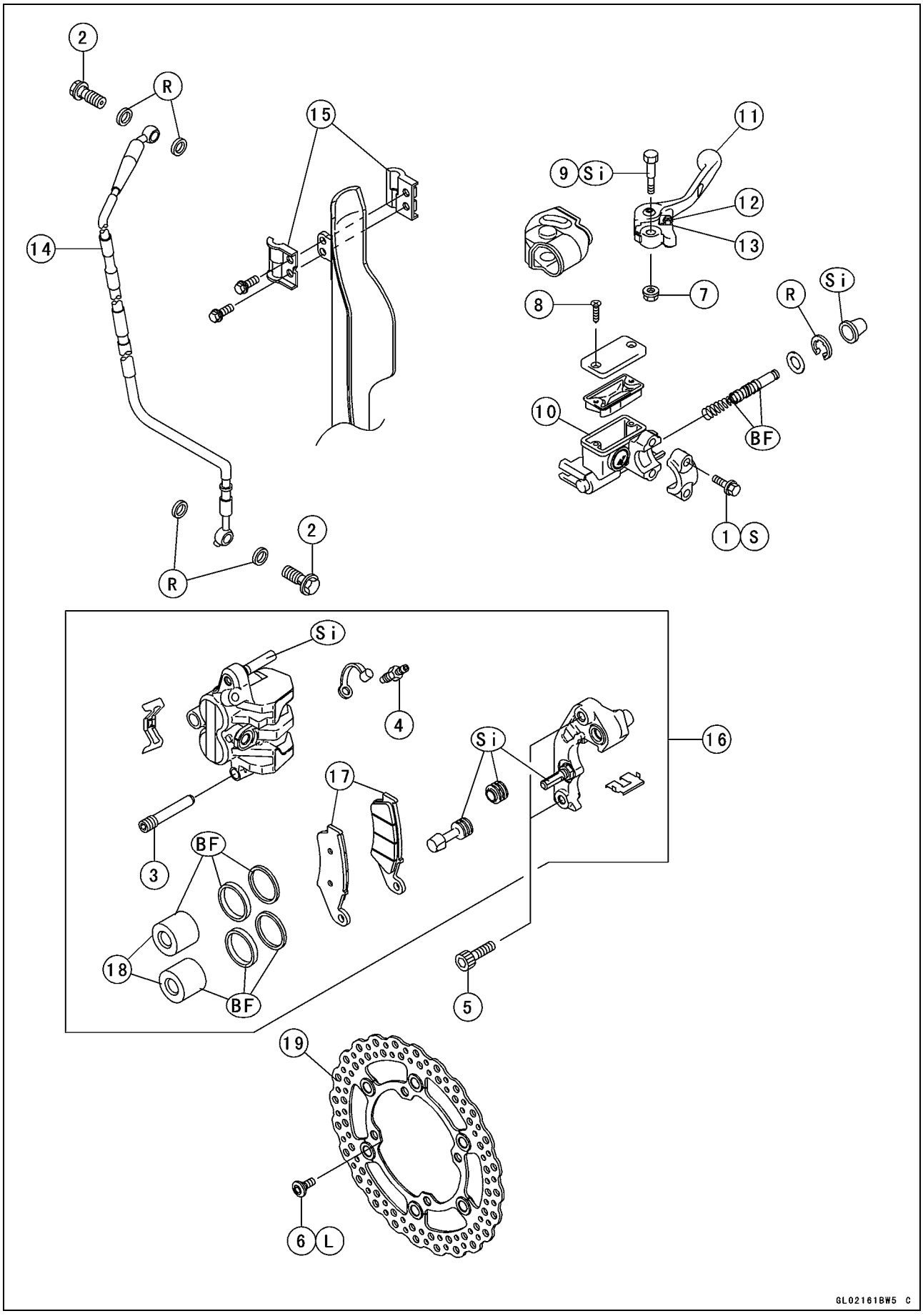
- Refer to the Rear Sprocket Wrap (Runout) Inspection in the Periodic Maintenance chapter.

Brakes

Table of Contents

Exploded View 12-2
Specifications 12-6
Special Tools 12-7
Brake Lever, Brake Pedal 12-8
  Brake Lever Play Adjustment 12-8
  Brake Pedal Position/Pedal Play Adjustment 12-8
  Brake Pedal Removal 12-8
  Brake Pedal Installation 12-8
Brake Fluid 12-9
  Brake Fluid Level Inspection 12-9
  Brake Fluid Change 12-9
  Bleeding the Brake Line 12-10
Caliper 12-12
  Caliper Removal 12-12
  Caliper Installation 12-12
  Caliper Disassembly 12-13
  Fluid Seal Damage Inspection 12-13
  Dust Seal and Cover Damage Inspection 12-13
  Piston, Cylinder Damage Inspection 12-13
  Caliper Holder Shaft Wear Inspection 12-13
Brake Pad 12-14
  Brake Pad Removal 12-14
  Brake Pad Installation 12-14
  Brake Pad Inspection 12-15
Master Cylinder 12-16
  Front Master Cylinder Removal 12-16
  Front Master Cylinder Installation 12-16
  Rear Master Cylinder Removal 12-17
  Rear Master Cylinder Installation 12-17
  Front Master Cylinder Disassembly 12-18
  Rear Master Cylinder Disassembly 12-18
  Master Cylinder Assembly 12-18
  Master Cylinder Inspection (Visual Inspection) 12-19
Brake Disk 12-20
  Brake Disc Inspection 12-20
  Brake Disc Removal 12-20
  Brake Disc Installation 12-20
Brake Hose 12-21
  Brake Hose Removal/Installation 12-21
  Brake Hose Inspection 12-21

Exploded View



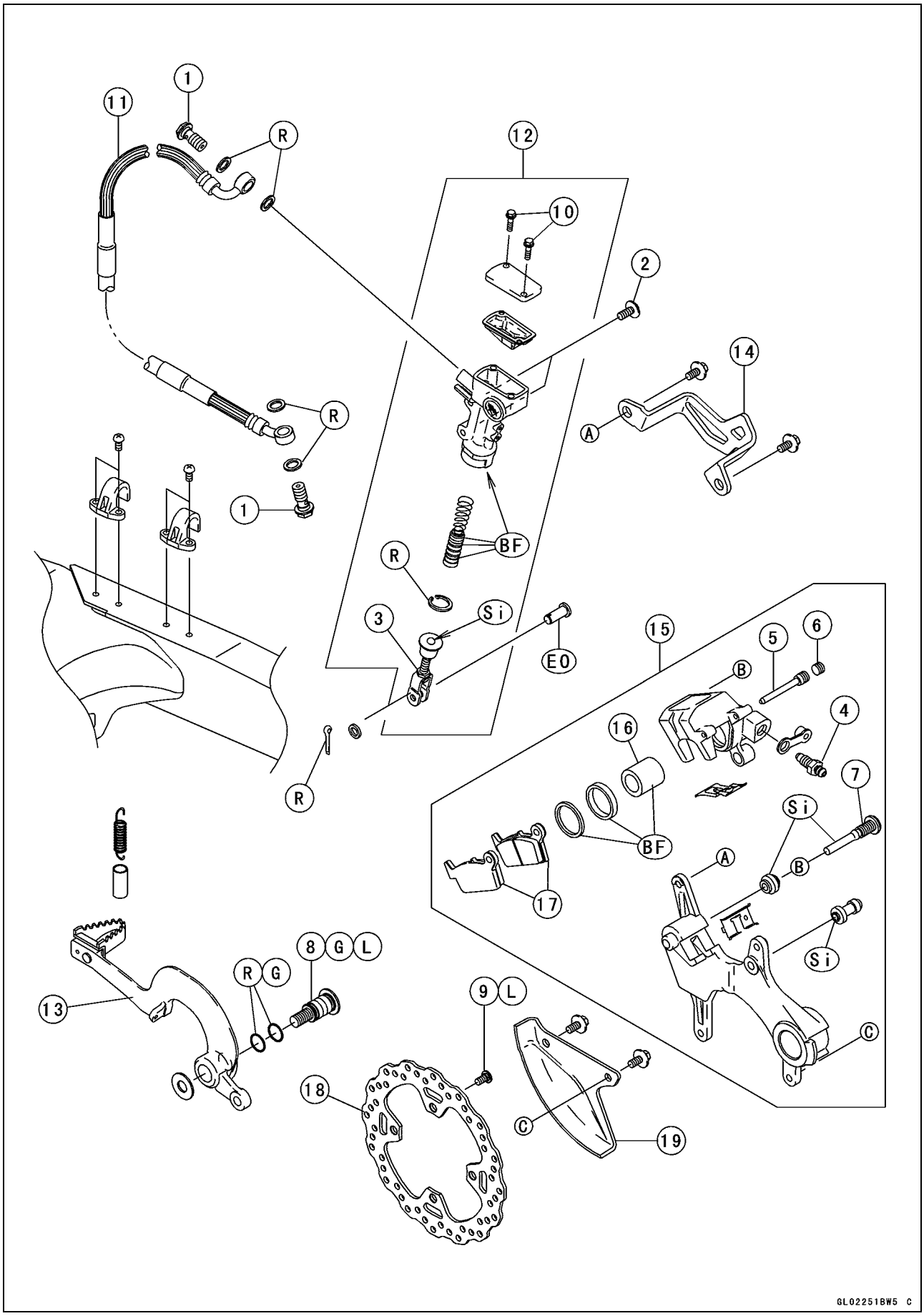
Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Front Master Cylinder Clamp Bolts	8.8	0.9	78 in·lb	S
2	Brake Hose Banjo Bolts	25	2.5	18	
3	Brake Pad Bolt	17	1.7	12.5	
4	Caliper Bleed Valve	7.8	0.8	69 in·lb	
5	Caliper Mounting Bolts (Front)	25	2.5	18	
6	Front Brake Disc Mounting Bolts	9.8	1.0	87 in·lb	L
7	Brake Lever Pivot Bolt Locknut	5.9	0.6	52 in·lb	
8	Brake Reservoir Cap Screws	1.5	0.15	13 in·lb	
9	Brake Lever Pivot Bolt	5.9	0.6	52 in·lb	

10. Front Brake Reservoir
11. Brake Lever
12. Brake Lever Adjuster
13. Locknut
14. Brake Hose
15. Clamps
16. Front Caliper
17. Brake Pad
18. Piston
19. Front Disc

BF: Apply brake fluid.
L: Apply a non-permanent locking agent.
R: Replacement Parts.
Si: Apply Silicone grease.

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Brake Hose Banjo Bolts	25	2.5	18	
2	Rear Master Cylinder Mounting Bolts	9.8	1.0	87 in·lb	
3	Rear Master Cylinder Push Rod Locknut	17	1.7	12.5	
4	Caliper Bleed Valve	7.8	0.8	69 in·lb	
5	Brake Pad Bolt	17	1.7	12.5	
6	Rear Brake Pad Bolt Plug	2.5	0.25	22 in·lb	
7	Caliper Holder Shaft	27	2.8	20	
8	Brake Pedal Mounting Bolt	25	2.5	18	L
9	Rear Brake Disc Mounting Bolts	23	2.3	16.5	L
10	Brake Reservoir Cap Bolts	1.5	0.15	13 in·lb	

11. Brake Hose
12. Rear Master Cylinder
13. Brake Pedal
14. Rear Caliper Cover
15. Rear Caliper
16. Piston
17. Brake Pads
18. Rear Disc
19. Rear Disc Cover

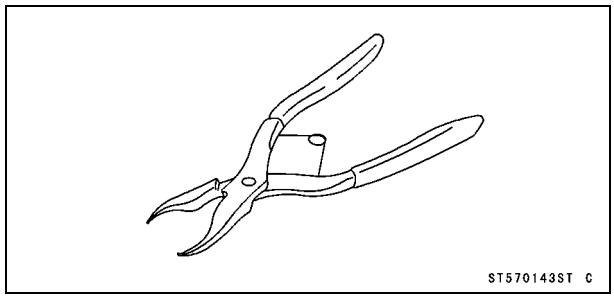
BF: Apply brake fluid.
EO: Apply engine oil.
G: Apply high temperature grease.
L: Apply a non-permanent locking agent.
R: Replacement Parts
Si: Apply Silicone grease.

Specifications

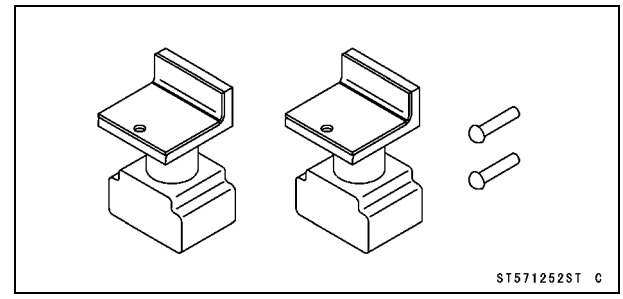
Item	Standard	Service Limit
Brake adjustment		
Lever Play	Adjustable (to suit rider)	– – –
Brake Fluid		
Recommended Disc Brake Fluid:		– – –
Type		
Front	DOT3 or DOT4	– – –
Rear	DOT4	
Brake Pads		
Lining Thickness:		
Front	4.0 mm (0.157 in.)	1 mm (0.04 in.)
Rear	6.4 mm (0.252 in.)	1 mm (0.04 in.)
Brake Disc		
Thickness:		
Front	2.85 ~ 3.15 mm (0.112 ~ 0.124 in.)	2.5 mm (0.10 in.)
Rear	3.85 ~ 4.15 mm (0.152 ~ 0.163 in.)	3.5 mm (0.14 in.)
Runout	TIR 0.12 mm (0.0047 in.) or less	TIR 0.3 mm (0.01 in.)

Special Tools

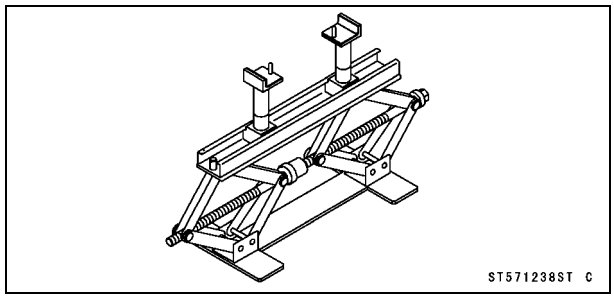
Inside Circlip Pliers:
57001-143



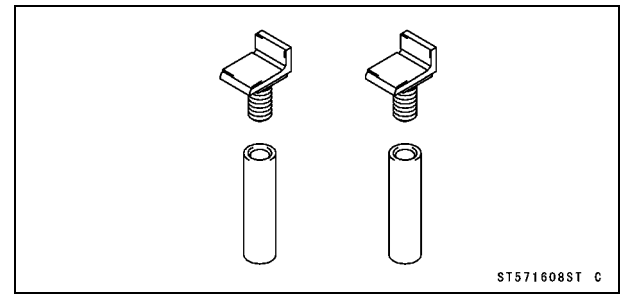
Attachment Jack:
57001-1252



Jack:
57001-1238



Jack Attachment:
57001-1608



Brake Lever, Brake Pedal

Brake Lever Play Adjustment

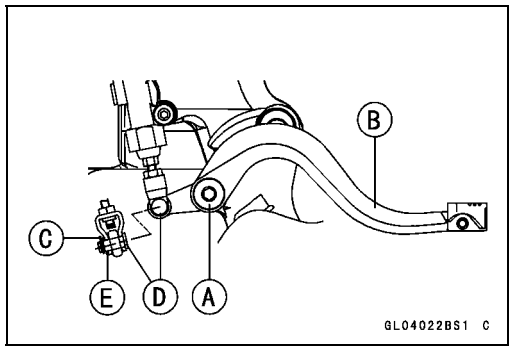
- Refer to the Brake Lever Play Adjustment in the Periodic Maintenance chapter.

Brake Pedal Position/Pedal Play Adjustment

- Refer to Brake Pedal Position/Pedal Play Adjustment in the Periodic Maintenance chapter.

Brake Pedal Removal

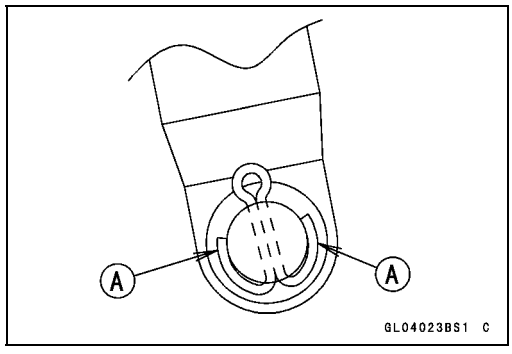
- Remove the mounting bolt [A] and take off the brake pedal [B] and return spring.
- Remove:
  Cotter Pin [C]
  Joint Pin [D]
  Washer [E]



Brake Pedal Installation

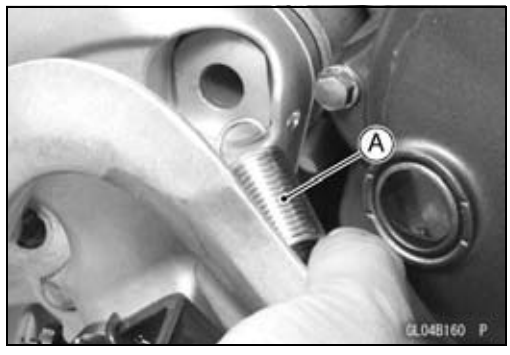
- Install the joint pin, washer and a new cotter pin.

○Bend the ends [A] of the cotter pin.



- Install the return spring direction [A] as shown.

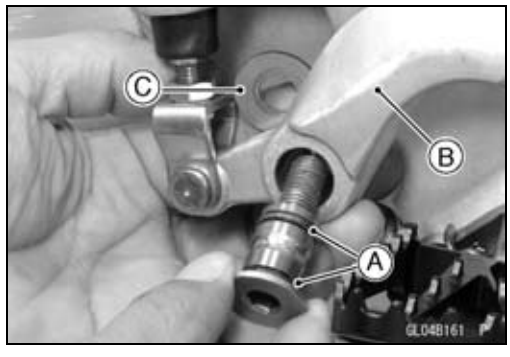
Torque - Brake Pedal Mounting Bolt: 25 N·m (2.5 kgf·m, 18 ft·lb)



- Replace O-rings [A] with new one.
- Apply a non-permanent locking agent to the pedal mounting bolt.
- Apply high temperature grease to the O-rings and shaft portion of the mounting bolt.
- Apply a non-premanent locking agent to the thread of the brake pedal mounting bolt.
- Install the brake pedal [B].

○Install the washer [C] inside the pedal.

- Check the brake pedal position.



Brake Fluid

⚠ WARNING

When working with the disc brake, observe the precautions listed below.

1. Never reuse old brake fluid.
2. Do not use fluid from a container that has been left unsealed or that has been open for a long time.
3. Do not mix two types and brands of fluid for use in the brake. This lowers the brake fluid boiling point and could cause the brake to be ineffective. It may also cause the rubber brake parts to deteriorate.
4. Don't leave the reservoir cap off for any length of time to avoid moisture contamination of the fluid.
5. Don't change the fluid in the rain or when a strong wind is blowing.
6. Except for the disc pads and disc, use only disc brake fluid, isopropyl alcohol, or ethyl alcohol for cleaning of the brake parts. Do not use any other fluid for cleaning these parts. Gasoline, engine oil, or any other petroleum distillate will cause deterioration of the rubber parts. Oil spilled on any part will be difficult to wash off completely and will eventually deteriorate the rubber used in the disc brake.
7. When handling the disc pads or disc, be careful that no disc brake fluid or any oil gets on them. Clean off any fluid or oil that inadvertently gets on the pads or disc with a high flash-point solvent. Do not use one which will leave an oily residue. Replace the pads with new ones if they cannot be cleaned satisfactorily.
8. Brake fluid quickly ruins painted surfaces; any spilled fluid should be completely wiped up immediately.
9. If any of the brake line fittings or the bleed valve is opened at any time, the **AIR MUST BE BLED FROM THE BRAKE LINE.**

Brake Fluid Level Inspection

- Refer to the Brake Fluid Level Inspection in the Periodic Maintenance chapter.

Brake Fluid Change

- Refer to the Brake Fluid Change in the Periodic Maintenance chapter.

Brake Fluid

Bleeding the Brake Line

The brake fluid has a very low compression coefficient so that almost all the movement of the brake lever or pedal is transmitted directly to the caliper for braking action. Air, however, is easily compressed. When air enters the brake lines, brake lever or pedal movement will be partially used in compressing the air. This will make the lever or pedal feel spongy, and there will be a loss in braking power.

⚠ WARNING

Be sure to bleed the air from the brake whenever brake lever or pedal action feels soft or spongy, after the brake fluid is changed, or whenever a brake line fitting has been loosened for any reason.

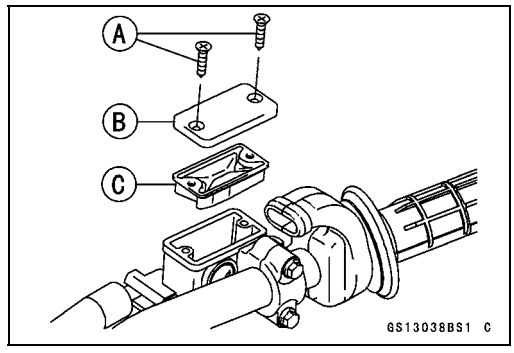
NOTE

○*The procedure to bleed the front brake line is as follows. Bleeding the rear brake line is the same as for the front brake.*

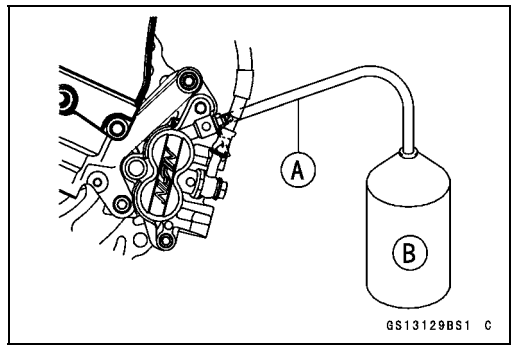
- Level the brake fluid reservoir.
- Remove:
  Screws [A]
  Reservoir Cap [B]
  Diaphragm [C]
- Check that there is plenty of fluid in the reservoir.
- With the reservoir cap off, slowly pump the brake lever several times until no air bubbles can be seen rising up through the fluid from the holes at the bottom of the reservoir.

○Bleed the air completely from the master cylinder by this operation.

- Fit on the diaphragm.



- Attach a clear plastic hose [A] to the bleed valve on the caliper, and run the other end of the hose into a container [B].



Brake Fluid

● Bleed the brake line and the caliper as follows:
○Repeat this operation until no more air can be seen coming out into the plastic hose.
1. Pump the brake lever until it becomes hard, and apply the brake and hold it [A].
2. Quickly open and close the bleed valve while holding the brake applied [B].
3. Release the brake [C].

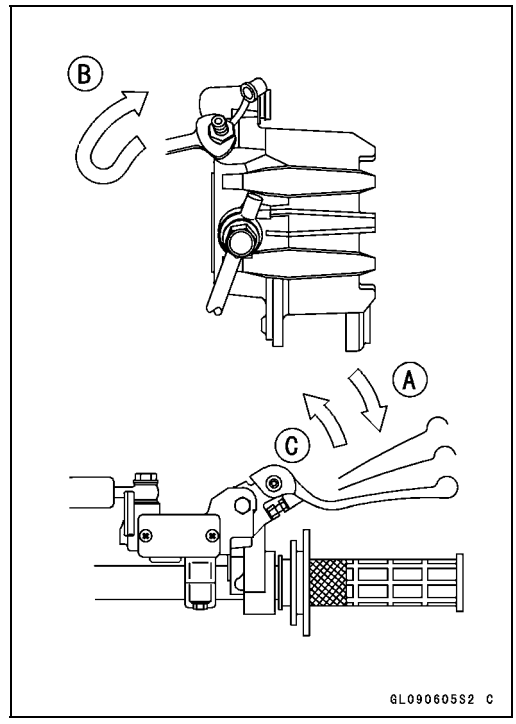
NOTE

○*The fluid level must be checked often during the bleeding operation and replenished with fresh brake fluid as necessary. If the fluid in the reservoir runs almost out any time during bleeding operation, the bleeding operation must be done over again from the beginning since air will have entered the line.*
○*Tap the brake hose lightly from the caliper to the reservoir for easier bleeding.*

● Remove the clear plastic hose.
● Tighten the bleed valves, and install the rubber caps.

Torque - Caliper Bleed Valve: 7.8 N·m (0.8 kgf·m, 69 in·lb)

● Check the fluid level.
● After bleeding is done, check the brake for good braking power, no brake drag, and no fluid leakage.



⚠ WARNING

Do not attempt to drive the motorcycle until a full brake lever or pedal is obtained by pumping the brake lever or pedal until the pads are against the disc. The brake will not function on the first application of the lever or pedal if this in not done.

Caliper

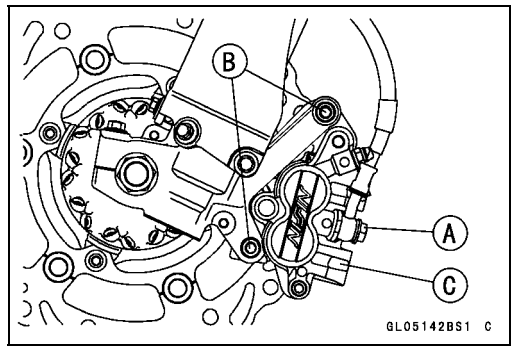
Caliper Removal

Front Brake:

- Loosen the banjo bolt [A] so as not to spill brake fluid.
- Remove the caliper mounting bolts [B].
- Remove the banjo bolt and take off the brake hose from the caliper [C].
- If the caliper is to be disassembled after removal and if compressed air is not available, remove the piston using the following steps before disconnecting the brake hose from the caliper.

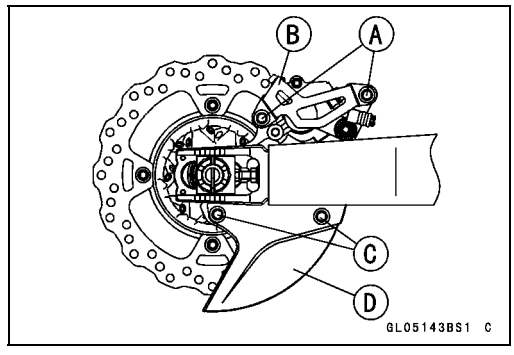
○Remove the pads.

○Pump the brake lever to remove the piston.



Rear Brake:

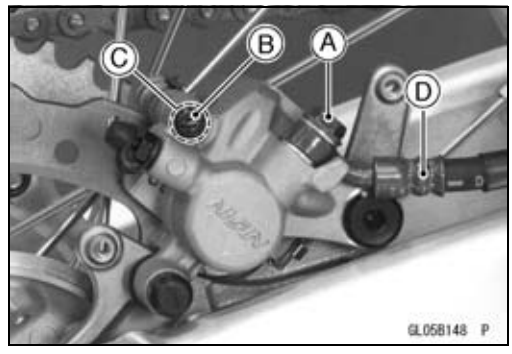
- Unscrew the caliper guard bolts [A] and remove the caliper guard [B].
- Unscrew the disc guard bolts [C] and remove the disc guard [D].



- Loosen the banjo bolt [A] so as not to spill brake fluid.
- Loosen the brake pad cap bolt [B], and pad bolt [C] before the caliper removal if the caliper is to be disassembled.

NOTE

○*If the caliper is to be disassembled after removal and compressed air is not available, disassemble the caliper before brake hose removal (see Caliper Disassembly).*



- Remove the rear wheel. (see Rear Wheel Removal in the Wheels/Tires chapter)
- Unscrew the banjo bolt and remove the brake hose [D] from the caliper (see Brake Hose Removal/Installation).

CAUTION
Immediately wipe up any brake fluid that is spilled.

Caliper Installation

- Tighten the brake pad bolts if it was removed.

Torque - Brake Pad Bolts: 17 N·m (1.7 kgf·m, 12.5 ft·lb)

Front Brake:

- Install the caliper and tighten the bolts.

Torque - Caliper Mounting Bolts (Front): 25 N·m (2.5 kgf·m, 18 ft·lb)

Rear Brake:

- Install the rear wheel with the caliper (see Rear Wheel Installation in the Wheels/Tires chapter).

Torque - Caliper Holde Shaft: 27 N·m (2.8 kgf·m, 20 ft·lb)

- Install the brake hose lower end.

○Replace the washers that are on each side of hose fitting with new ones.

Torque - Brake Hose Banjo Bolt: 25 N·m (2.5 kgf·m, 18 ft·lb)

Caliper

- Bleed the brake line (see Bleeding the Brake Line).
- Check the brake for good braking power, no brake drag, and no fluid leakage.

⚠ WARNING

Do not attempt to drive the motorcycle until a full brake lever or pedal is obtained by pumping the brake lever or pedal until the pads are against the disc. The brakes will not function on the first application of the lever or pedal if this is not done.

Caliper Disassembly

- Refer to the Caliper Piston Seal and Dust Seal Replacement in the Periodic Maintenance chapter.

Fluid Seal Damage Inspection

The fluid seal around the piston maintains the proper pad/disc clearance. If this seal is not in good condition, pad wear will increase, and constant pad drag on the disc will raise brake and brake fluid temperature.

- Replace the fluid seals under any of the following conditions: (a) fluid leakage around the pad; (b) brakes overheat; (c) there is a large difference in left and right pad wear; (d) the seal is stuck to the piston. If the fluid seal is replaced, replace the dust seal as well. Also, replace all seals every other time the pads are changed.

Dust Seal and Cover Damage Inspection

- Check that the dust seals and covers are not cracked, worn, swollen, or otherwise damaged.

★If they show any damage, replace them.

Piston, Cylinder Damage Inspection

- Visually inspect the piston and cylinder surfaces.

★Replace the cylinder and piston if they are badly scored or rusty.

Caliper Holder Shaft Wear Inspection

The caliper body must slide smoothly on the caliper holder shafts. If the body does not slide smoothly, one pad will wear more than the other, pad wear will increase, and constant drag on the disc will raise brake and brake fluid temperature.

- Check too see if the caliper holder shafts are not badly worn or stepped, or the rubber boot is not damaged.

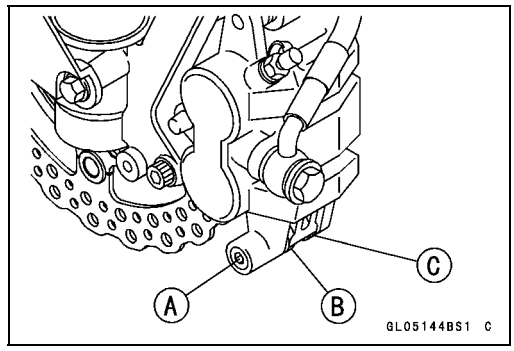
★If the shafts or rubber boot are damaged, replace the shafts, rubber boot, and the caliper holder.

Brake Pad

Brake Pad Removal

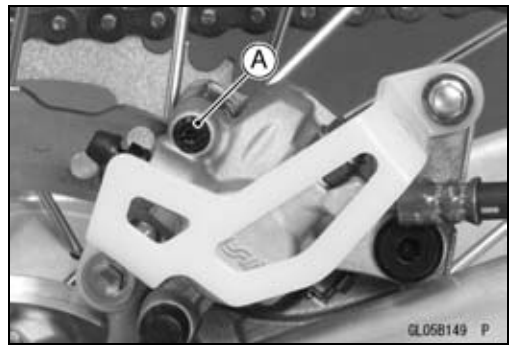
For Front Brake Pad

- Unscrew the pad bolt [A].
- Take the piston side pad [B].
- Push the caliper holder toward the piston, and then remove another pad [C] from the caliper holder.

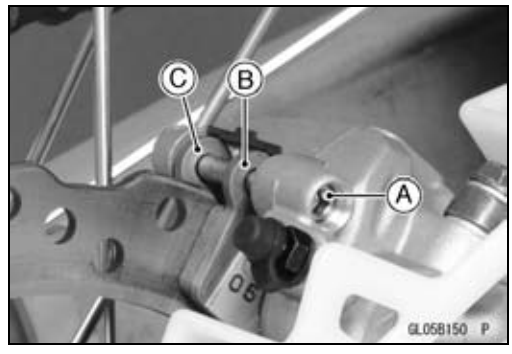


For Rear Brake Pad

- Remove:
  Pad Bolt Plug [A]



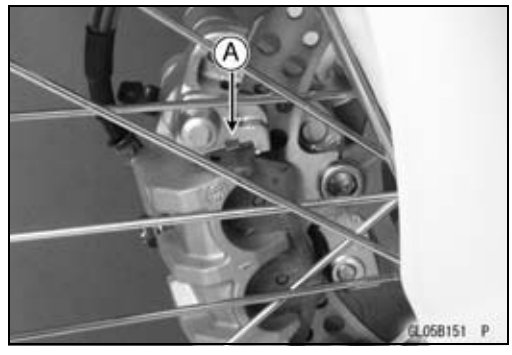
- Unscrew the pad bolt [A].
- Take the piston side pad [B].
- Push the caliper holder toward the piston, and then remove another pad [C] from the caliper holder.

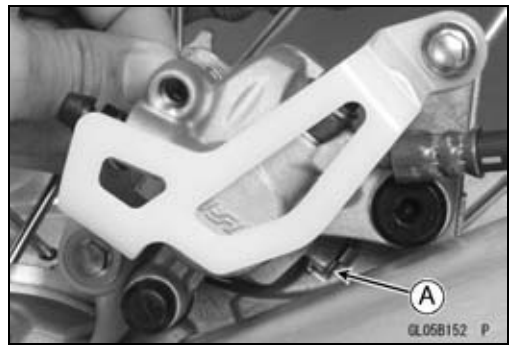


Brake Pad Installation

- Push the caliper pistons in by hand as far as they will go.
- Install the piston side pad first, and then another pad.

○Fit the pad end [A] into the groove of the anti-rattle spring securely.





Brake Pad

- Tighten the brake pad bolt.

Torque - Brake Pad Bolt: 17 N·m (1.7 kgf·m, 12.5 ft·lb)
Rear Brake Pad Bolt Plug: 2.5 N·m (0.25 kgf·m, 22 in·lb)

- Check the brake for good braking power, no brake drag, and no fluid leakage.

⚠ WARNING

Do not attempt to drive the motorcycle until a full brake lever or pedal is obtained by pumping the brake lever or pedal until the pads are against the disc. The brake will not function on the first application of the lever or pedal if this is not done.

Brake Pad Inspection

- Refer to the Brake Pad Wear Inspection in the Periodic Maintenance chapter.

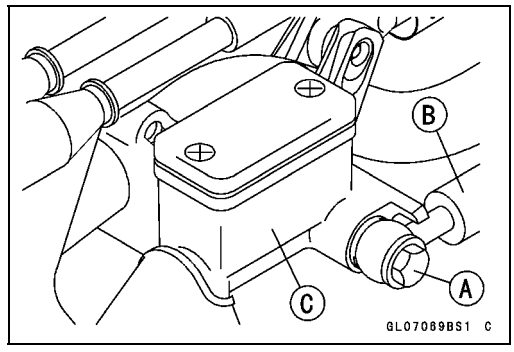
Master Cylinder

CAUTION

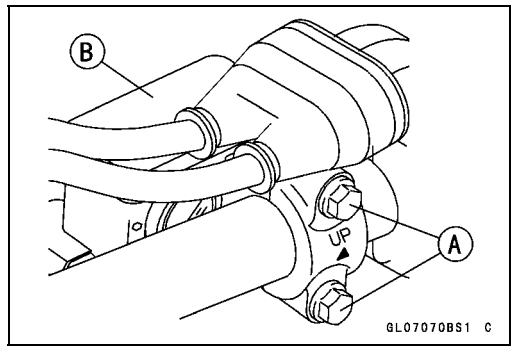
Brake fluid quickly ruins painted or plastic surfaces; any spilled fluid should be completely wished up immediately.

Front Master Cylinder Removal

- Remove the banjo bolt [A] to disconnect the upper brake hose [B] from the master cylinder [C].
- When removing the brake hose, temporarily secure the end of the brake hose to some high place to keep fluid loss to a minimum.

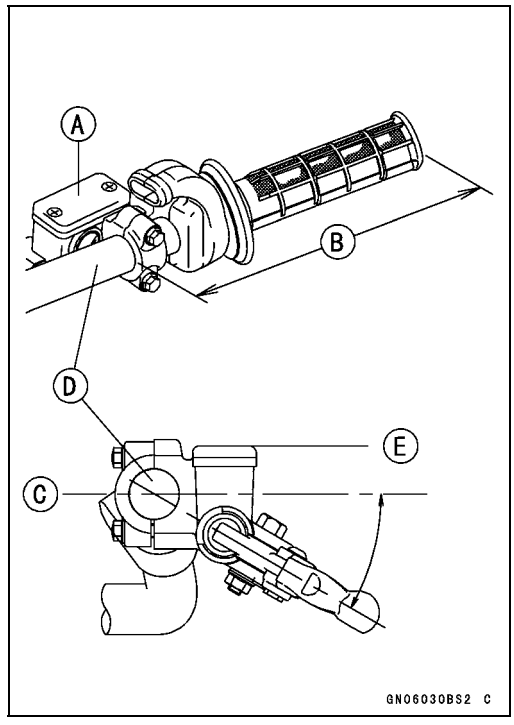


- Unscrew the clamp bolts [A], and take off the master cylinder [B] as an assembly with the reservoir and brake lever.

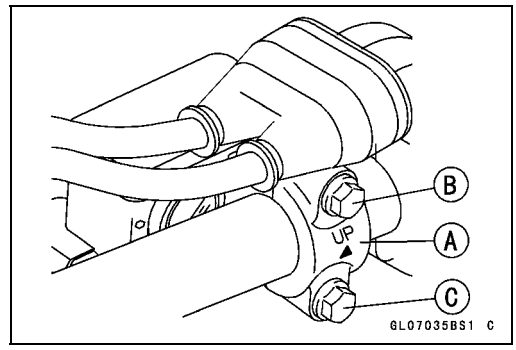


Front Master Cylinder Installation

- Install the master cylinder [A] position as shown in the figure.
  [B] 185 mm (7.28 in.)
  [C] Horizontal Line of Frame
  [D] Handlebar
  [E] Horizontal Line of Cap Surface



Master Cylinder



- The master cylinder clamp must be installed with the arrow mark [A] upward.

○Tighten the upper clamp bolt [B] first, and then the lower clamp bolt [C]. There will be a gap at the lower part of the clamp after tightening.

Torque - Front Master Cylinder Clamp Bolts: 8.8 N·m (0.9 kgf·m, 78 in·lb)

- Replace the washers that are on each side of hose fitting with new ones.
- Tighten the brake hose banjo bolt.

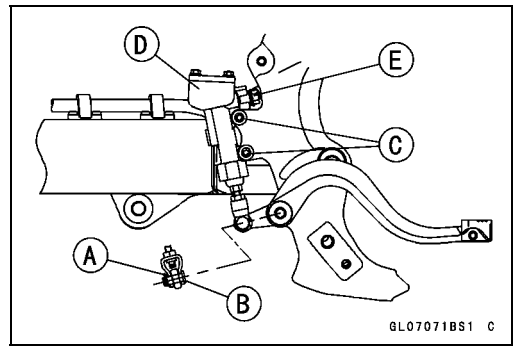
Torque - Brake Hose Banjo Bolt: 25 N·m (2.5 kgf·m, 18 ft·lb)

- Bleed the brake line (see Bleeding the Brake Line).
- Check the brake for good braking power, no brake drag, and no fluid leakage.

⚠ WARNING

Do not attempt to drive the motorcycle until a full brake lever is obtained by pumping the brake lever until the pads are against the disc. The brake will not function on the first application of the lever or pedal if this is not done.

Rear Master Cylinder Removal



- Remove the cotter pin [A].
- Pull off the joint pin [B] with washer.

NOTE

○*Pull off the joint pin while pressing down the brake pedal.*

- Unscrew the master cylinder mounting bolts [C], and remove the master cylinder [D].
- Unscrew the brake hose banjo bolt [E].
- When removing the brake hose, temporarily secure the end of the brake hose to some high place to keep fluid loss to a minimum.

Rear Master Cylinder Installation

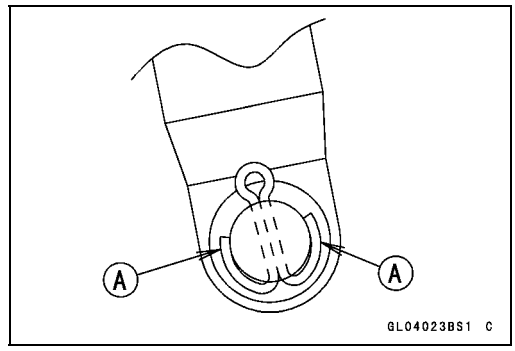
- Replace the washers are on each side of hose fitting with new ones.
- Tighten:

Torque - Brake Hose Banjo Bolt: 25 N·m (2.5 kgf·m, 18 ft·lb)
Rear Master Cylinder Mounting Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)

Master Cylinder

- Replace the cotter pin with a new one.
- Install the joint pin, washer and a new cotter pin.
- Bend the ends [A] of the cotter pin.

Torque - Rear Master Cylinder Push Rod Locknut: 17 N·m (1.7 kgf·m, 12.5 ft·lb)



- Bleed the brake line (see Bleeding the Brake Line).
- Check the brake for good braking power, no brake drag, and no fluid leakage.
- Check the brake pedal position (see Brake Lever and Pedal Adjustment in the Periodic Maintenance chapter).

Front Master Cylinder Disassembly

- Refer to the Brake Master Cylinder Cup and Dust Cover Replacement in the Periodic Maintenance chapter.

Rear Master Cylinder Disassembly

- Refer to the Brake Master Cylinder Cup and Dust Cover Replacement in the Periodic Maintenance chapter.

Master Cylinder Assembly

- Refer to the Brake Master Cylinder Cup and Dust Cover Replacement in the Periodic Maintenance chapter.

Master Cylinder

Master Cylinder Inspection (Visual Inspection)

- Disassemble the front and rear master cylinders.
- Check that there are no scratches, rust or pitting on the inner wall of each master cylinder [A] and on the outside of each piston [B].

★If a master cylinder or piston shows any damage, replace them.

- Inspect the primary [C] and secondary [D] cups.

★If a cup is worn, damaged, softened (rotted), or swollen, the piston assembly should be replace to renew the cups.

★If fluid leakage is noted at the brake lever, the piston assembly should be replaced to renew the cup.

- Check the dust covers [E] for damage.

★If they are damaged, replace them.

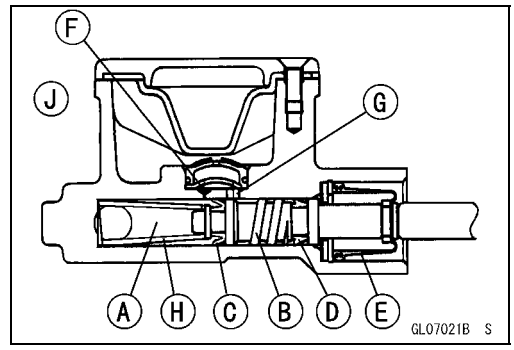
- Check that the relief [F] and supply [G] ports are not plugged.

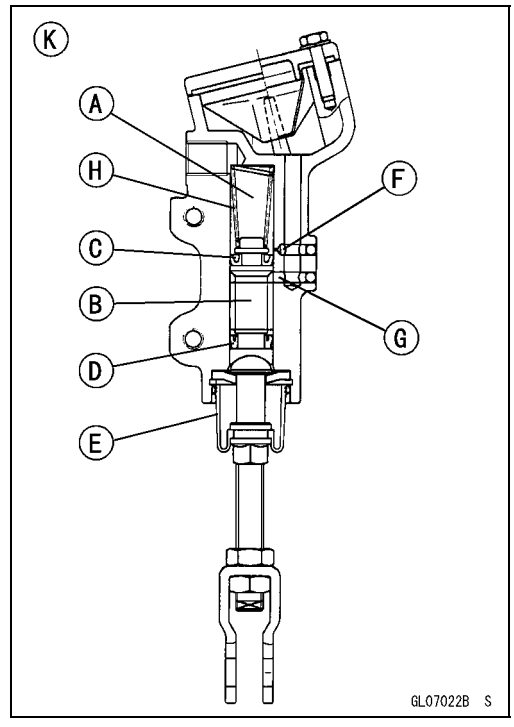
★If the small relief port becomes plugged, the brake pads will drag on the disc. Blow the ports clean with compressed air.

- Check the piston return springs [H] for any damage.

★If a spring is damaged, replace it.

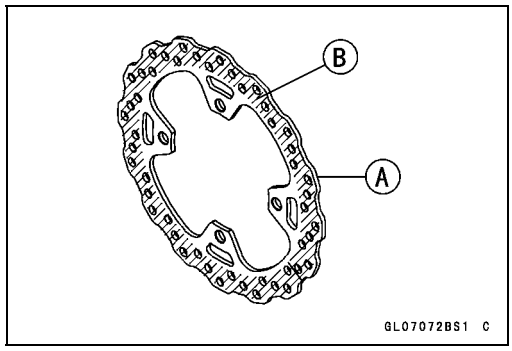
[J] Front Master Cylinder
[K] Rear Master Cylinder





Brake Disk

Brake Disc Inspection



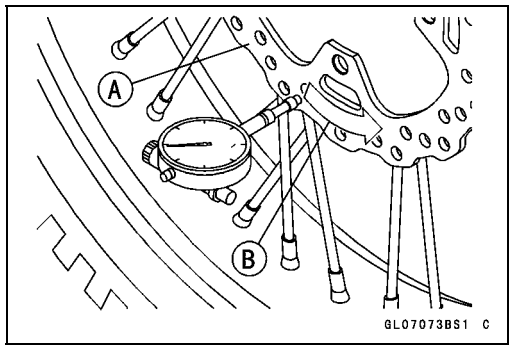
- Visually inspect the disc [A].

★If it is scratched or damaged, replace the disc.

- Measure the thickness of each disc at the point [B] where it has worn the most.

★Replace the disc if it has worn past the service limit.

Thickness
Standard:
Front **2.85 ~ 3.15 mm (0.112 ~ 0.124 in.)**
Rear **3.85 ~ 4.15 mm (0.152 ~ 0.163 in.)**
Service Limit:
Front **2.5 mm (0.10 in.)**
Rear **3.5 mm (0.14 in.)**



- Place a jack under the motorcycle so that the front/rear wheel is raised off the ground.

Special Tool - Jack: 57001-1238
Attachment Jack: 57001-1252
Jack Attachment: 57001-1608

- Set up a dial gauge against the disc [A] as illustrated.

○For the front disc, turn the handlebar fully to one side.

- Measure the disc runout while rotating the wheel slowly [B].

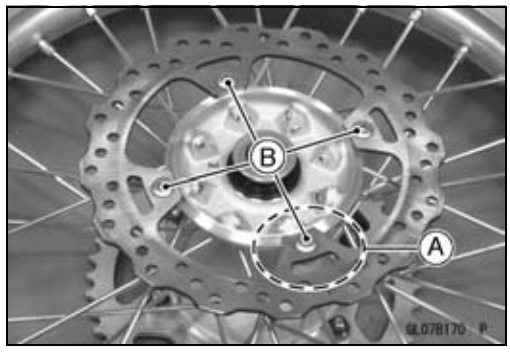
★If the runout exceeds the service limit, replace the disc.

Runout
Standard: **TIR 0.12 mm (0.0047 in.) or less**
Service Limit: **TIR 0.3 mm (0.01 in.)**

Brake Disc Removal

- Remove the wheels (see Front Wheel Removal, Rear Wheel Removal in the Wheels/Tires chapter).
- Unscrew the mounting bolts, and take off the disc.

Brake Disc Installation



- Install the brake disc on the wheel so that the marked side [A] faces out.
- Apply a non-permanent locking agent to the threads of the rear brake disc mounting bolts [B].
- Tighten:

Torque - Rear Brake Disc Mounting Bolts: 23 N·m (2.3 kgf·m, 16.5 ft·lb)
Front Brake Disc Mounting Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)

Brake Hose

Brake Hose Removal/Installation

- Refer to the Brake Hose Replacement in the Periodic Maintenance chapter.

Brake Hose Inspection

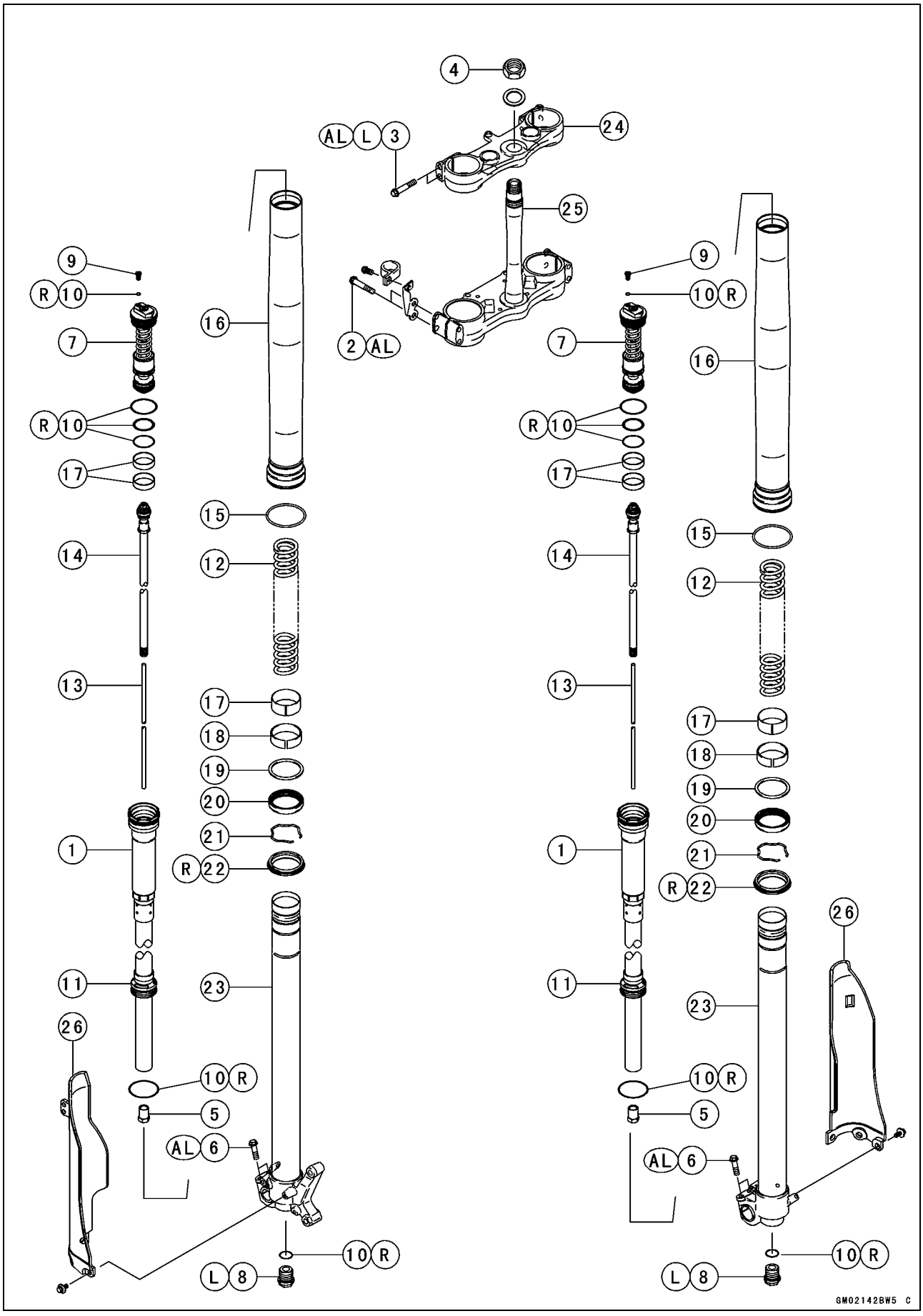
- Refer to the Brake Hoses and Connections Inspection in the Periodic Maintenance chapter.

Suspension

Table of Contents

Exploded View 13-2
Specifications 13-6
Special Tools 13-8
Front Fork 13-10
Air Pressure 13-10
Rebound Damping Adjustment 13-10
Compression Damping Adjustment 13-11
Oil Change/Oil Level Adjustment (each fork leg) 13-11
Front Fork Removal 13-11
Front Fork Installation 13-13
Front Fork Disassembly (each fork leg) 13-13
Front Fork Assembly 13-18
Inner Tube Inspection 13-25
Slide/Guide Bushing Inspection ... 13-26
Dust Seal/Oil Seal Inspection 13-26
Spring Tension Inspection 13-26
Rear Shock Absorber 13-27
Rebound Damping Adjustment 13-27
Compression Damping Adjustment 13-27
Spring Preload Adjustment 13-28
Spring Tension Inspection 13-30
Rear Shock Absorber Removal ... 13-30
Rear Shock Absorber Installation 13-30
Rear Shock Absorber Spring Replacement 13-31
Rear Shock Absorber Disassembly (Oil Change) 13-31
Rear Shock Absorber Assembly .. 13-31
Rear Shock Absorber Scrapping . 13-32
Swingarm 13-33
Swingarm Removal 13-33
Swingarm Installation 13-34
Swingarm Bearing Removal 13-34
Swingarm Bearing Installation 13-34
Drive Chain Guide, Guide Roller, Chain Slipper Wear Inspection .. 13-34
Swingarm Bearing, Sleeve Inspection 13-35
Tie-Rod, Rocker Arm 13-36
Tie-Rod Removal 13-36
Tie-Rod Installation 13-36
Rocker Arm Removal 13-36
Rocker Arm Installation 13-37
Tie-Rod and Rocker Arm Bearing Removal 13-38
Tie-Rod and Rocker Arm Bearing Installation 13-38
Needle Bearing Inspection 13-39
Uni-Trak Maintenance 13-40
Uni-Trak Linkage Inspection 13-40
Tie-Rod and Rocker Arm Sleeve Wear Inspection 13-40
Tie-Rod and Rocker Arm Mounting Bolt Bend Inspection . 13-40

Exploded View



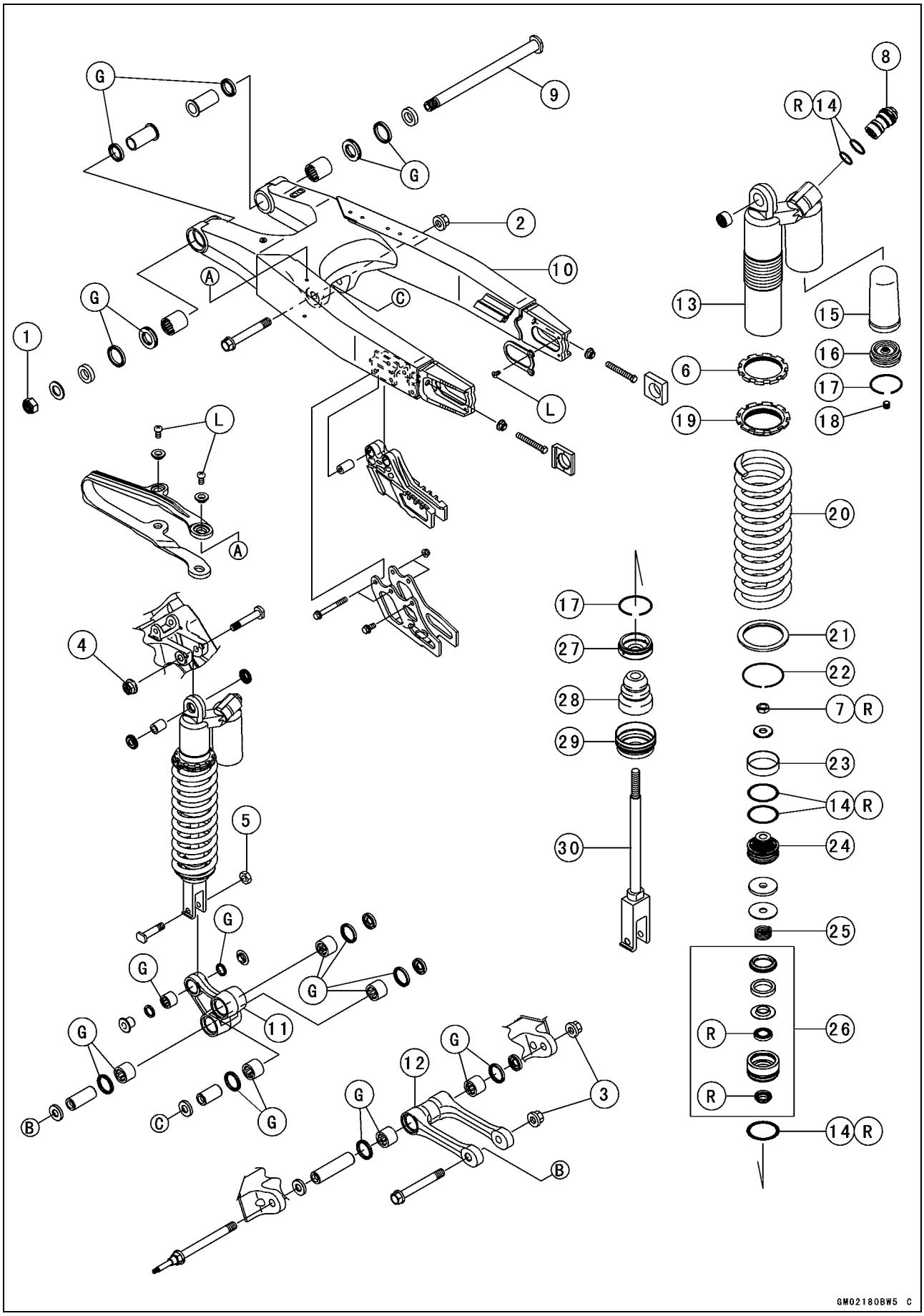
Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Front Fork Cylinder Unit	34	3.5	25	
2	Front Fork Clamp Bolts (Lower)	20	2.0	14.5	AL
3	Front Fork Clamp Bolts (Upper)	20	2.0	14.5	L, AL
4	Steering Stem Head Nut	98	10	72	
5	Adjuster Assembly Locknut	22	2.2	16	
6	Front Axle Clamp Bolts	20	2.0	14.5	AL
7	Front Fork Base Valve Assembly	29	3.0	22	
8	Front Fork Adjuster Assembly	69	7.0	51	L
9.	Pressure Relief Screw	1.3	0.13	11 in·lb	

10. O-rings
11. Fork Spring Seats
12. Springs
13. Rebound Damping Adjuster Rods
14. Piston Rod Assies
15. Wear Rings
16. Outer Tubes
17. Slide Bushings
18. Guide Bushings
19. Washers
20. Oil Seals
21. Retaining Rings
22. Dust Seals
23. Fork Inner Tubes
24. Steering Stem Heads
25. Steering Stems
26. Fork Protectors

AL: Tighten the two clamp bolts alternately two times to ensure even tightening torque.
L: Apply a non-permanent locking agent to the threads.
R: Replacement Parts

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Swingarm Pivot Shaft Nut	98	10	72	
2	Rocker Arm Pivot Nut (KX250T6F)	83	8.5	61	
	Rocker Arm Pivot Nut (KX250T7F ~)	59	6.0	44	
3	Tie-Rod Mounting Nut (Front, Rear) (KX250T6F)	83	8.5	61	
	Tie-Rod Mounting Nut (Front, Rear) (KX250T7F ~)	59	6.0	44	
4	Rear Shock Absorber Mounting Nut (Upper)	39	4.0	29	
5	Rear Shock Absorber Mounting Nut (Lower)	34	3.5	25	
6	Rear Shock Absorber Spring Locknut	45	4.6	33	
7	Piston Rod Locknut	37	3.8	27	
8	Gas Reservoir Damping Adjuster Assembly	29	3.0	21	

9. Pivot Shaft
10. Swingarm
11. Rocker Arm
12. Tie-Rod
13. Rear Shock Absorber Cylinder
14. O-rings
15. Bladder
16. Cap
17. Circlips
18. Valve Cap
19. Adjusting Nut
20. Spring
21. Spring Seat
22. Circlips
23. Slide Bushing
24. Piston
25. Spring
26. Oil Seal Assembly
27. Stopper
28. Damper
29. Damper Holder
30. Piston Rod

G: Apply grease
L: Apply a non-permanent locking agent.
R: Replacement Parts

Specifications

Item	Standard	Service Limit
Front Fork		
Air Pressure	Atmospheric pressure	– – –
Rebound Damping Adjustment (from the seated position adjuster turned fully clockwise)	10 clicks counterclockwise , (EUR) 14 clicks counterclockwise (KX250T6F)	(Adjustable Range) 20 ±4 clicks
	8 clicks counterclockwise (KX250T7F)	
	9 clicks counterclockwise (KX250T8F)	
Compression Damping Adjustment (from the seated position adjuster turned fully clockwise)	11 clicks counterclockwise , (EUR) 10 clicks counterclockwise (KX250T6F)	(Adjustable Range) 22 ±6 clicks
	9 clicks counterclockwise, (EUR) 7 clicks counterclockwise (KX250T7F)	
	9 clicks counterclockwise, (EUR) 8 clicks counterclockwise (KX250T8F)	
Oil Viscosity	SHOWA SS-05 or Equivalent	– – –
Oil Capacity (per unit):		
Cylinder Unit	193 mL (6.53 US oz.)	– – –
Oil Level	42 ~ 49 mm (1.65 ~ 1.93 in.)	– – –
Outer Tube	360 ±2.5 mL (12.2 ±0.10 US oz.) (KX250T6F)	(Adjustable Range) 322 ~ 417 mL (10.9 ~ 14.1 US oz.) (KX250T6F)
	373 ±2.5 mL (12.6 ±0.08 US oz.) (KX250T7F)	324 ~ 419 mL (11.0 ~ 14.2 US oz.) (KX250T7F)
	374 ±2.5 mL (12.6 ±0.08 US oz.), (EUR) 371 ±2.5 mL (12.5 ±0.08 US oz.)(KX250T8F)	319 ~ 415 mL (10.8 ~ 14.0 US oz.) (KX250T8F)
Fork Spring Free Length	495 mm (19.5 in.)	485 mm (19.09 in.)
Rear Shock Absorber		
Rebound Damping Adjustment (from the seated position adjuster turned fully clockwise)	11 clicks counterclockwise (EUR) 12 clicks counterclockwise (KX250T6F)	(Adjustable Range) 22 ±5 clicks
	10 clicks counterclockwise (EUR) 11 clicks counterclockwise (KX250T8F)	
Spring Preload Adjustment (Adjusting nut position from the center of the mounting hole upper)	123.5 mm (4.4862 in.), (EUR) 125.3 mm (4.933 in.) (KX250T6F)	(Adjustable Range) 122.1 ~ 131.6 mm (4.807 ~ 5.181 in.) (KX250T6F)
	127.9 mm (5.035 in.) (KX250T7F) 129.1 mm (5.083 in.), (EUR) 128.6 (5.063 in.) (KX250T8F)	125.8 ~ 133.8 mm (4.953 ~ 5.268 in.) (KX250T7F ~)

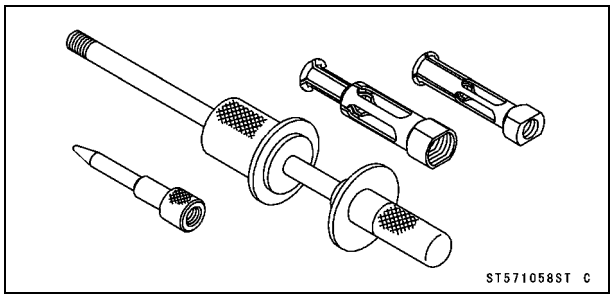
Specifications

Item	Standard	Service Limit
Rear Shock Spring Free Length	265.0 mm (10.43 in.)	260 mm (10.24 in.)
Oil Viscosity	SHOWA SS-25 or equivalent	– – –
High Speed Compression Damping Adjustment	1 3/4 turns out (KX250T6F)	(Adjustable Range)
	2 turns out (KX250T7F)	4 ±0.5 turns out
	2 1/3 turns out, (EUR) 2 1/2 turns out (KX250T8F)	
Low Speed Compression Damping Adjustment (from the seated position adjuster turned fully clockwise)	11 clicks counterclockwise, (EUR) 10 clicks counterclockwise (KX250T6F) 10 clicks counterclockwise (KX250T7F) 10 clicks counterclockwise, (EUR) 11 clicks counterclockwise (KX250T8F)	(Adjustable Range) 19 ±6 clicks
Gas Pressure	980 kPa (10 kgf/cm², 142 psi)	– – –
Tie-Rod, Rocker Arm		
Sleeve Outside Diameter:		
Tie-rod	19.987 ~ 20.000 mm (0.7869 ~ 0.7874 in.)	19.85 mm (0.781 in.)
Rocker Arm		
Large	19.987 ~ 20.000 mm (0.7869 ~ 0.7874 in.)	19.85 mm (0.781 in.)
Small	15.989 ~ 16.000 mm (0.6293 ~ 0.6299 in.)	15.85 mm (0.624 in.)
Rocker Arm Mounting Bolt Runout	TIR 0.1 mm (0.004 in.) or less	0.2 mm (0.008 in.)

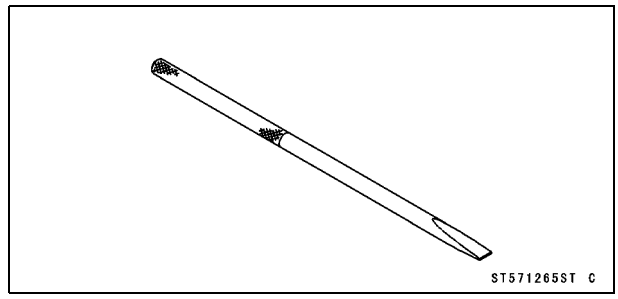
EUR: Europe Model

Special Tools

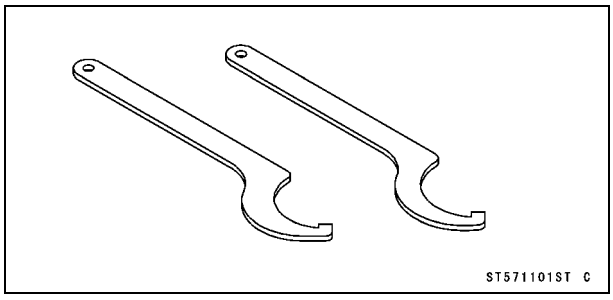
Oil Seal & Bearing Remover:
57001-1058



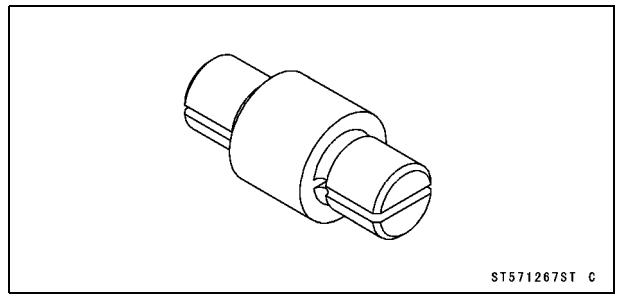
Bearing Remover Shaft, ϕ9:
57001-1265



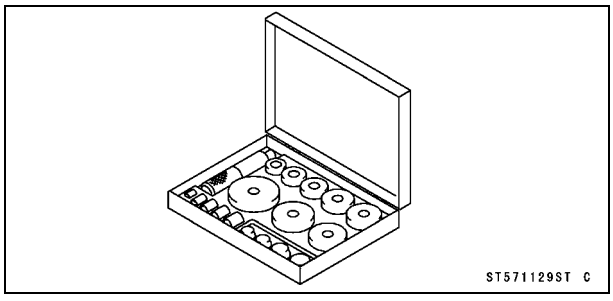
Hook Wrench R37.5, R42:
57001-1101



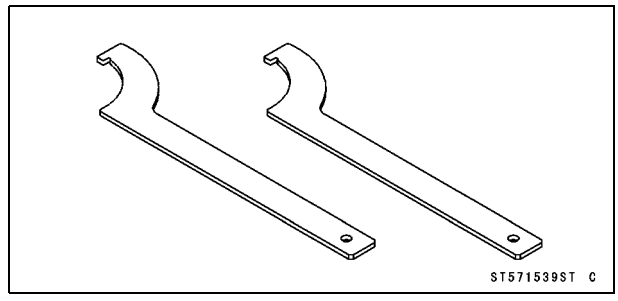
Bearing Remover Head, ϕ15 × ϕ17:
57001-1267



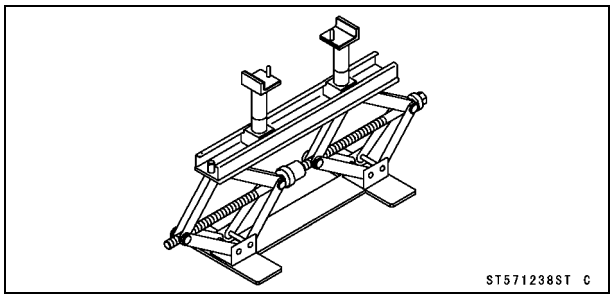
Bearing Driver Set:
57001-1129



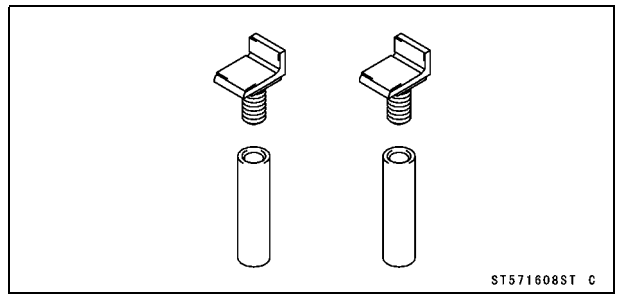
Hook Wrench T=3.2 R37:
57001-1539



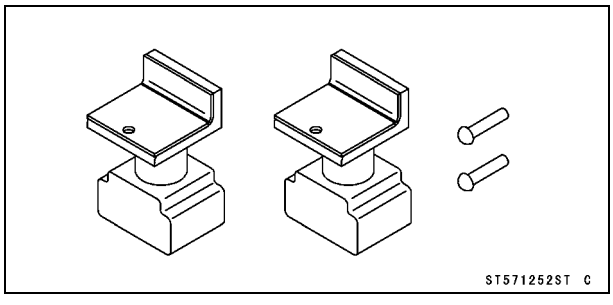
Jack:
57001-1238



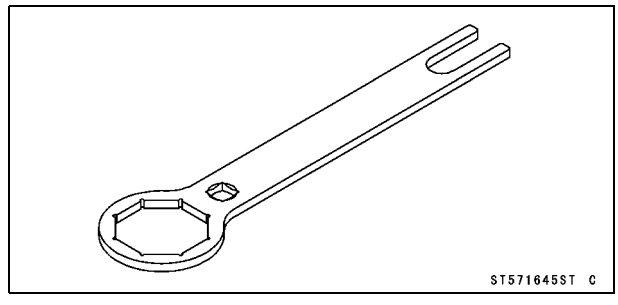
Jack Attachment:
57001-1608



Attachment Jack:
57001-1252

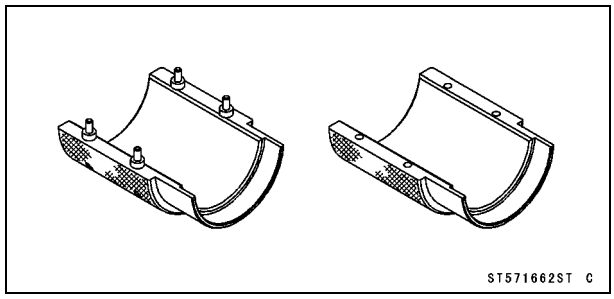


Top Plug Wrench, 50 mm:
57001-1645



Special Tools

Fork Oil Seal Driver, ϕ47:
57001-1662



Front Fork

Air Pressure

The standard air pressure in the front fork legs is atmospheric pressure. Air pressure in the fork legs increase with normal use, so the fork action stiffens during operation. Release air pressure form the fork legs prior to each race through the pressure relief screw located in each cap of the base valve assembly.

- Place the jack under the frame so that the front wheel is raised off the ground.

Special Tools - Jack: 57001-1238
Jack Attachment: 57001-1252 or 57001 -1608

- Remove the screws [A] at the top of the front fork to let the air pressure equalize.

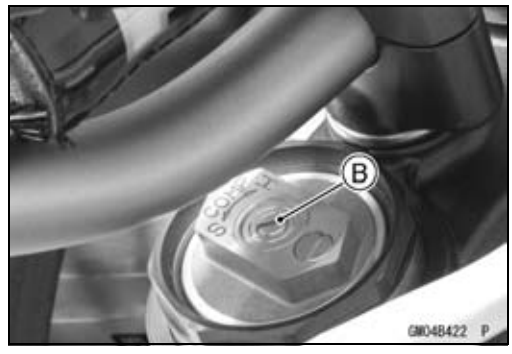
NOTE

○*Do not use the side stand when adjusting the air pressure.*
○*Adjust the air pressure when the front forks are cold.*

- Replace the O-ring with a new one.
- Install the screw.

Torque - Pressure Relief Screw: 1.3 N·m (0.13 kgf·m, in·lb)

Rebound Damping Adjustment



- Place the jack under the frame so that the front wheel is raised off the ground.

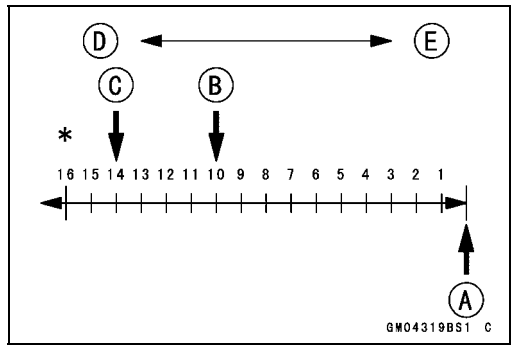
Special Tools - Jack: 57001-1238
Jack Attachment: 57001-1252 or 57001 -1608

- To adjust rebound damping, turn the adjuster [B] on the base valve assembly with the blade of a screwdriver until you feel a click. Adjust the rebound damping to suit you preference under special condition.

NOTE

○*The left and right fork legs must have the same shock damping.*

Seated positions: adjuster turned fully clockwise [A].



Rebound Damping Adjuster Setting

Standard:	**10 clicks [B], 14 clicks (Europe Model) [C] (KX250T6F)**
	8 clicks (KX250T7F)
	9 clicks (KX250T8F)
	Softer (Counterclockwise) [D]
	Harder (Clockwise) [E]

*: Number of turns counterclockwise usable range - 16 clicks or more.
Counterclockwise from the fully seated position.

Front Fork

Compression Damping Adjustment

- Place the jack under the frame so that the front wheel is raises off the ground.

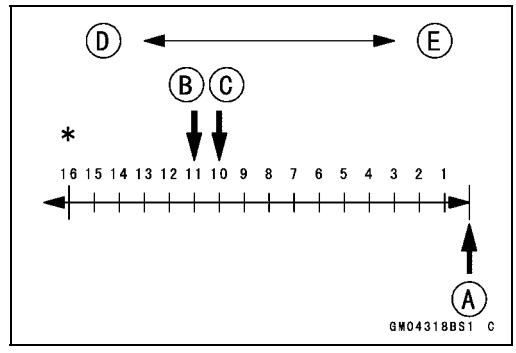
Special Tools - Jack: 57001-1238
Jack Attachment: 57001-1252 or 57001 -1608

- Clean the bottom of the fork tubes.
- Remove the caps on the bottom of the fork tubes.
- To adjust compression damping, turn the adjuster [A] on the front fork cylinder valve with the blade of a screwdriver until you feel a click. Adjust the compression damping to suit your preference under special condition.

NOTE

○*The left and right fork legs must have the same shock damping.*

Seated positions adjuster turned fully clockwise [A].



Compression Damping Adjuster Setting

Standard: **11 clicks [B], 10 clicks (Europe Model) [C] (KX250T6F)**
9 clicks, 7clicks (Europe Model) (KX250T7F)
9 clicks, 8clicks (Europe Model)(KX250T8F)
Softer (Counterclockwise) [D]
Harder (Clockwise) [E]

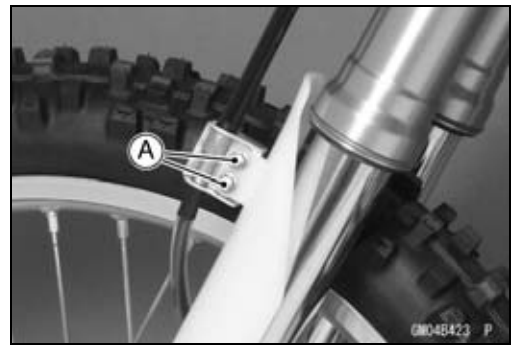
*: Number of turns counterclockwise usable range - 16 clicks or more.
Counterclockwise from the fully seated position.

- Put the caps into the bottom of the fork tubes.

Oil Change/Oil Level Adjustment (each fork leg)

- Refer to the Front Fork Oil Change in the Periodic Maintenance chapter.

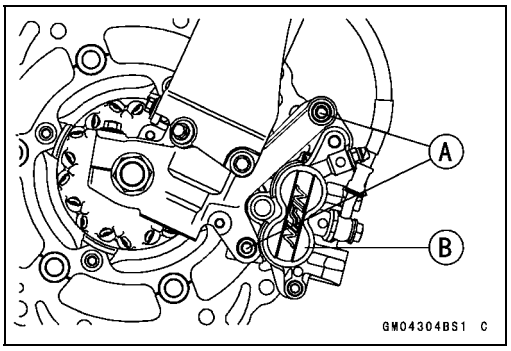
Front Fork Removal



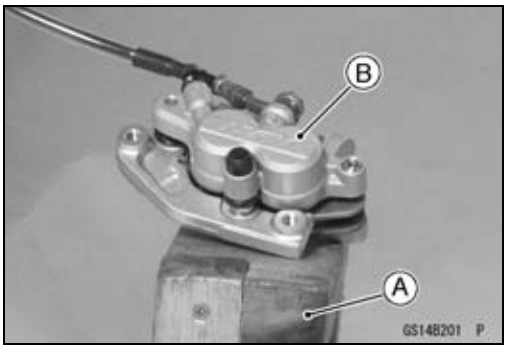
- For the left fork leg, unscrew the bolts [A], and remove the front brake hose clamps.

Front Fork

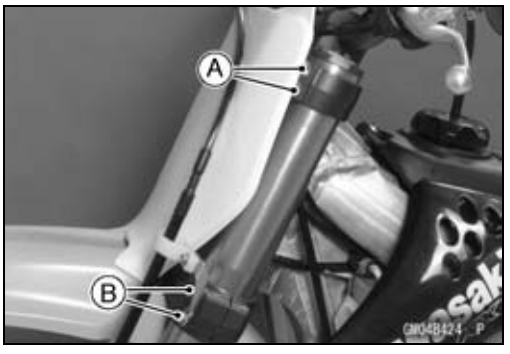
● Remove:
Front wheel (see Front Wheel Removal in the Wheels/Tires chapter)
Caliper Mounting Bolts [A] (for left fork leg)
● Remove the caliper [B] from the fork leg to be removed.



● Rest the caliper [B] on some kind of stand [A] so that it doesn't dangle.

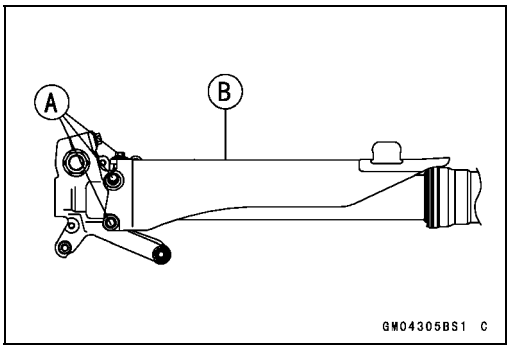


● Loosen the upper [A], and lower fork clamp bolts [B].



● Remove the front fork.
○With a twisting motion [A], work the fork leg [B] down and out.

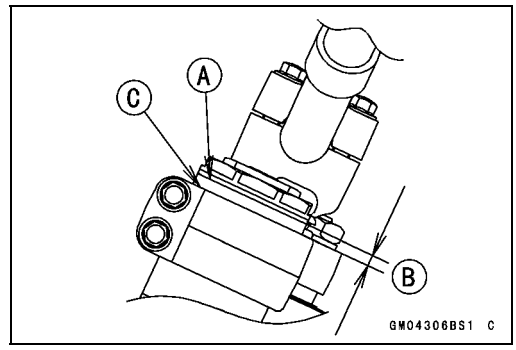
● Remove:
Bolts [A]
Fork Protector [B]



Front Fork

Front Fork Installation

- If the fork leg was disassembled, check the fork oil level.
- Install the fork so that the distance [B] between the top end [A] of the outer tube and the upper surface [C] of the steering stem head is specified dimension.
  [B] = 7 mm (0.59 in.)

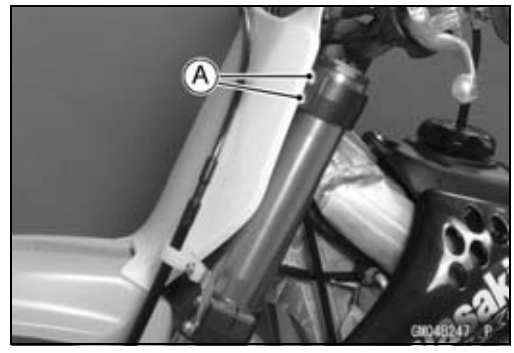


- Route the cables and hose according to the Cable, Harness, Hose Routing section in the Appendix chapter.
- Unscrew the upper clamp bolts [A].

○Apply a non-permanent locking agent to the bolts.

- Tighten the fork clamp bolts.

Torque - Front Fork Clamp Bolts (Upper): 20 N·m (2.0 kgf·m, 14.5 ft·lb)
Front Fork Clamp Bolts (Lower): 20 N·m (2.0 kgf·m, 14.5 ft·lb)



NOTE

○*Tighten the two clamp bolts alternately two times to ensure even tightening torque.*

- Tighten:

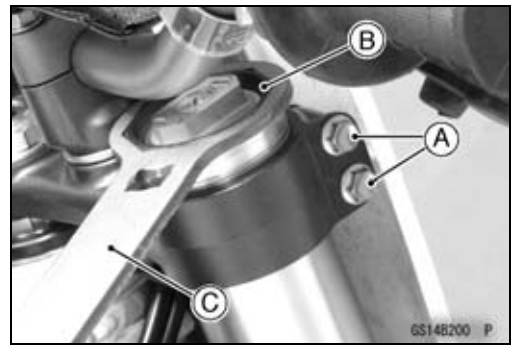
Torque - Front Caliper Mounting Bolts: 25 N·m (2.5 kgf·m, 18 ft·lb)

- Install the front wheel (see Front Wheel Installation in the Wheels/Tires chapter).
- Check the front brake operation after installation.

Front Fork Disassembly (each fork leg)

- Loosen the front fork upper clamp bolts [A]
- Loosen the front fork cylinder unit [B] using the top plug wrench [C].

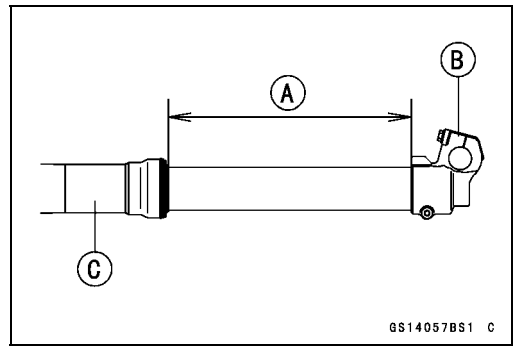
Special Tool - Top Plug Wrench, 50 mm: 57001-1645



- Remove the front fork (see Front Fork Removal).
- Measure the length [A] between the top surface of the axle holder [B] and under surface of the outer tube [C].

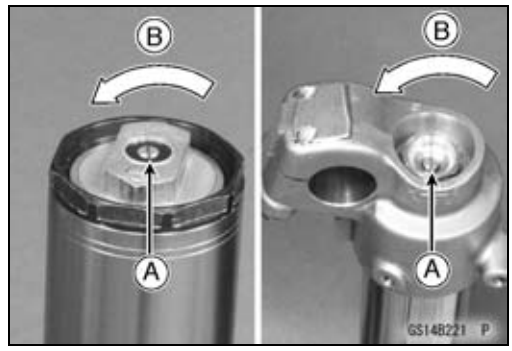
○Record the length before disassembling the fork.

Length
Standard: 319 ±2 mm (12.6 ±0.08 mm)

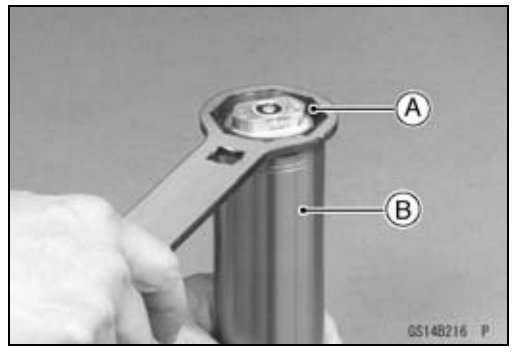


Front Fork

● Record the position of the damping adjusters [A] and then turn [B] it to the softest position.



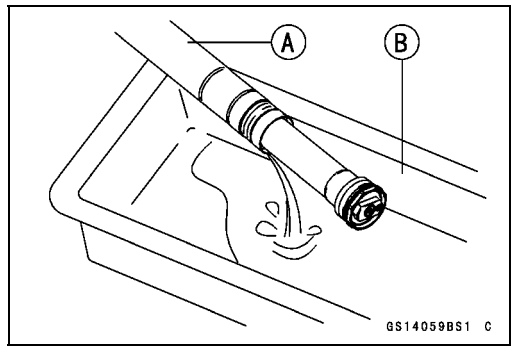
● Unscrew the fork cylinder unit [A] from the outer tube [B].
● Slowly slide down the outer tube.



● Hold the fork tube [A] upside down over a clean container [B] and pump it to drain the oil.

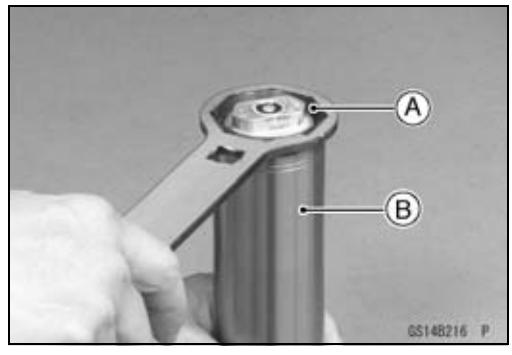
NOTE

○*Pump the outer tube up and down to discharge the fork oil.*



● Temporarily install the fork cylinder unit [A] to the outer tube [B].

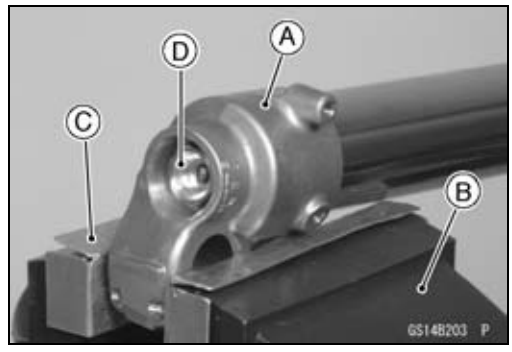
Special Tool - Top Plug Wrench, 50 mm: 57001-1645



● Hold the axle holder part [A] with a vise [B].
○Protect the axle holder part with a soft jaws [C] or heavy cloth when using a vise.
● Unscrew the adjuster assembly [D] completely.

NOTE

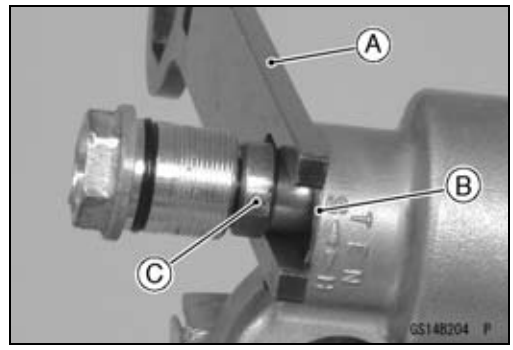
○*When removing the adjuster assembly, do not force to unscrew it at once using an impact wrench.*



Front Fork

- Compress the outer tube by hand and install the top plug wrench [A] between the axle holder part bottom [B] and locknut [C].

Special Tool - Top Plug Wrench, 50 mm: 57001-1645



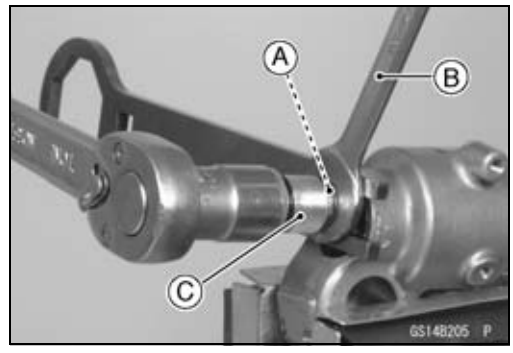
⚠ WARNING

Be careful of reaction force in spring and fix surely so that the special tool should not come off. Do not place the finger etc. while servicing.

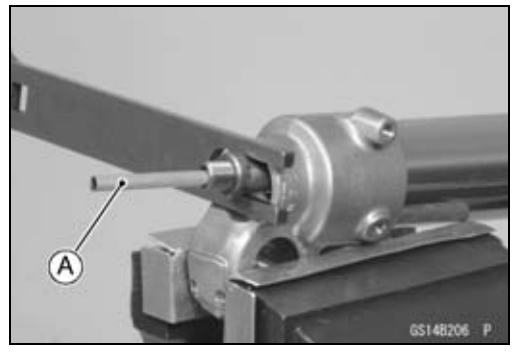
- Hold the locknut [A] with a wrench [B] and remove the adjuster assembly [C].

NOTE

○*Do not remove the locknut from the piston rod. The piston rod may slide into the inner tube.*



- Take the rebound damping adjuster rod [A] out of the piston rod.



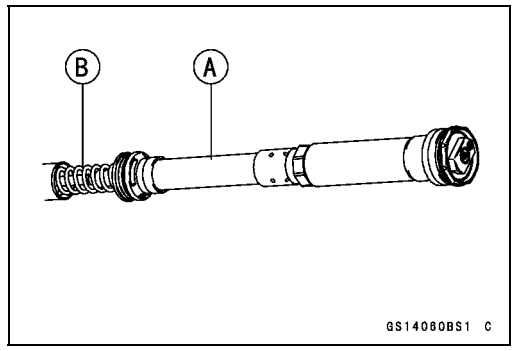
- With the outer tube compressed by hand, remove the top plug wrench.

CAUTION

Removing the locknut and pushing the piston rod thread into the cylinder unit will damage the oil seal. Do not remove the locknut from the piston rod. Be careful of reaction force from the fork spring when removing the top plug wrench. Hold the cylinder unit tight enough so that the locknut does not damage the fork leg.

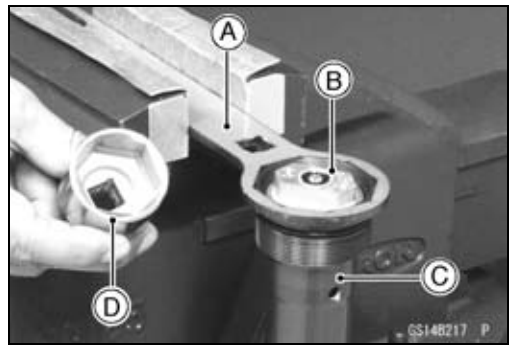
Front Fork

- Unscrew the fork cylinder unit.
- Remove:
  Fork Cylinder Unit [A]
  Spring [B]



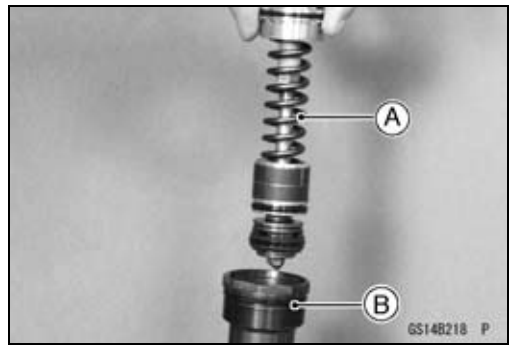
- Holding the top plug wrench [A] with a vise, unscrew the base valve assembly [B] on the fork cylinder unit [C].

○Use the hexagon box wrench [D].



- Pull out the base valve assembly [A] from the fork cylinder unit [B].

○Slowly compress the piston rod until it stops so that the base valve assembly can be removed easily.

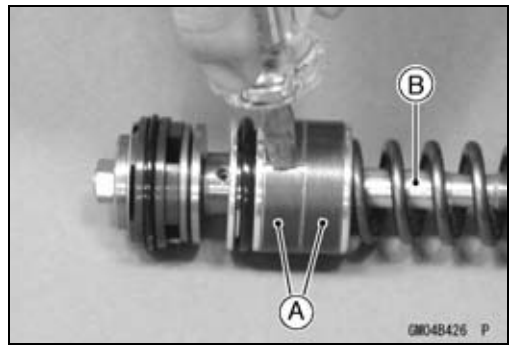


CAUTION

Be careful not to damage the bushing of the base valve assembly.
Disassembling the base valve assembly can lead to trouble. Do not disassemble the base valve assembly.

- Remove the bushings [A] from the base valve assembly [B].

○Carefully remove the bushing by prying the slot with a blade type screwdriver until the bushing can be pulled off by hand.



CAUTION

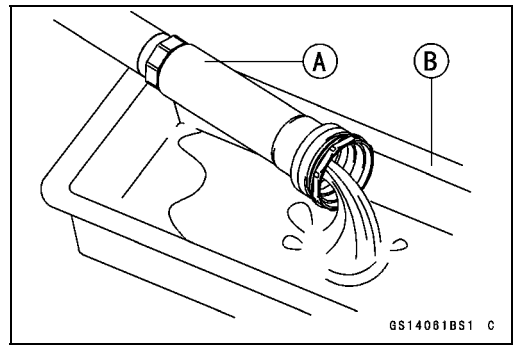
Be careful not to scratch the teflon coating of the bushing.
Do not pry open the bushing more than necessary.

Front Fork

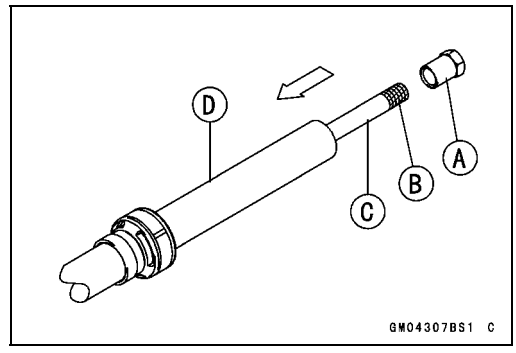
● Hold the fork cylinder unit [A] upside down over a clean container [B] and pump it to drain the oil.

NOTE

○*Pump the piston rod up and down to discharge the fork oil.*

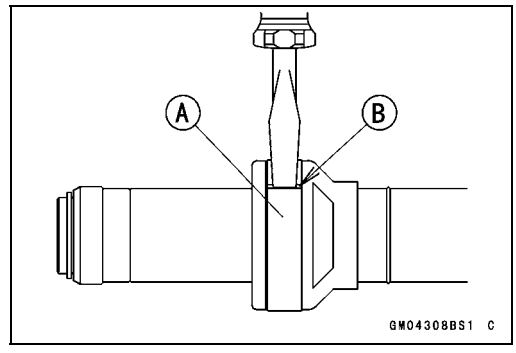


● Unscrew the locknut [A].
● Wrap the end of the piston rod with a vinyl tape [B].
● Push the piston rod [C] into the cylinder [D].

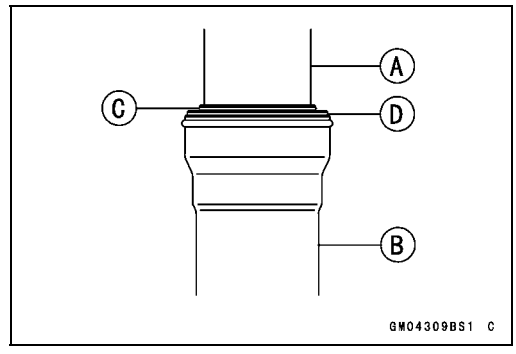


● Remove the bushing [A] from the cylinder.
○Carefully remove the bushing by prying the slot [B] with a blade type screwdriver until the bushing can be pulled off by hand.

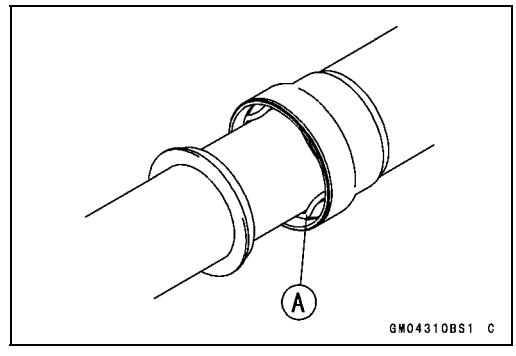
CAUTION
Be careful not to scratch the teflon coating of the bushing. **Do not pry open the bushing more than necessary.**



● Separate the inner tube [A] from the outer tube [B] as follows:
○Slide up the spring band [C].
○Slide up the dust seal [D].

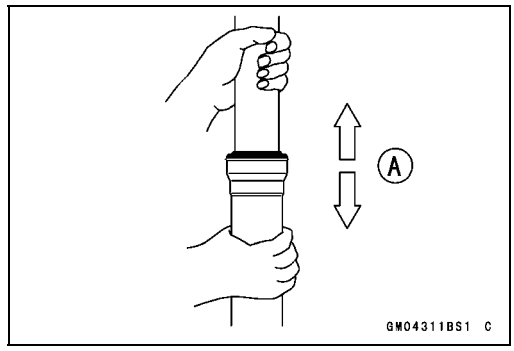


○Remove the retaining ring [A] from the outer tube.

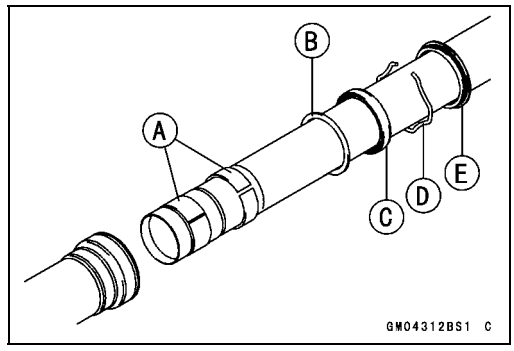


Front Fork

○Grasp the outer tube and stroke the inner tube up and down [A] several times. The shock to fork seal separates the inner tube from the outer tube.



● Remove the bushings [A], washer [B], oil seal [C], retaining ring [D], and dust seal [E] from the inner tube.



● Wipe off the fork oil from the removed parts.

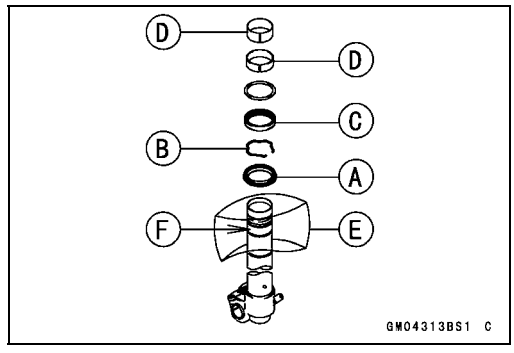
Front Fork Assembly

● Replace the following with new ones:
Dust Seal [A]
Retaining Ring [B]
Oil Seal [C]
Bushings [D]

● Place an oil coated plastic bag [E] over the end of the inner tube to protect the oil seals.

○The inner tube bushings groove has a sharp edge [F] that cut out the sealing lip of the seals as they are pushed down over the inner tube.

● Install in order these parts on the inner tube.

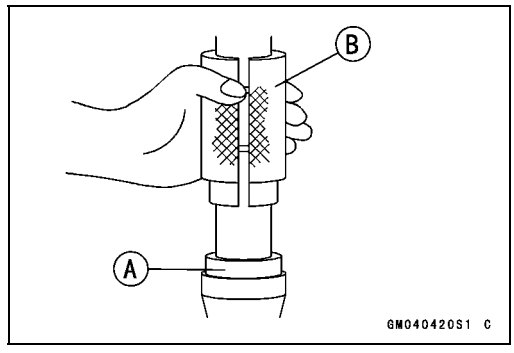


● When assembling the new outer tube bushings, washer and new oil seal [A], hold the oil seal against the new one, and tap the oil seal with the fork oil seal driver [B] until it stops.

Special Tool - Fork Oil Seal Driver, ϕ47: 57001-1662

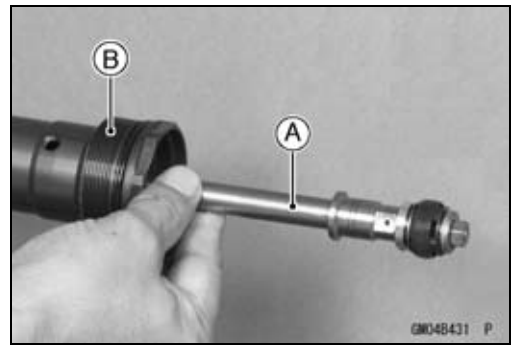
● Install the retaining ring to the outer tube.

● Push the dust seal into the outer tube.

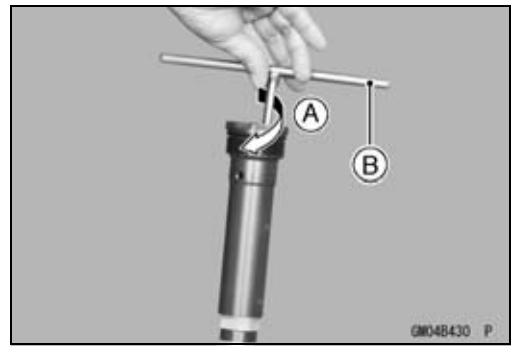


Front Fork

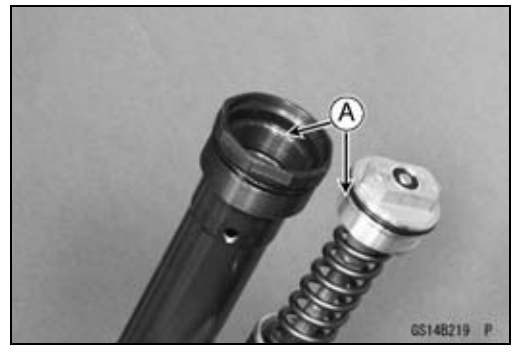
● Insert the piston rod [A] into the fork cylinder [B].
○Wrap the end of the piston rod with a vinyl tape.



○Turning in [A] the piston rod with a wrench [B].
● Remove a vinyl tape and install the locknut.

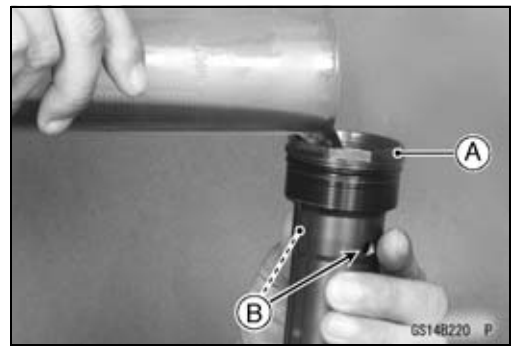


● Clean the threads [A] of the fork cylinder unit and base valve assembly.

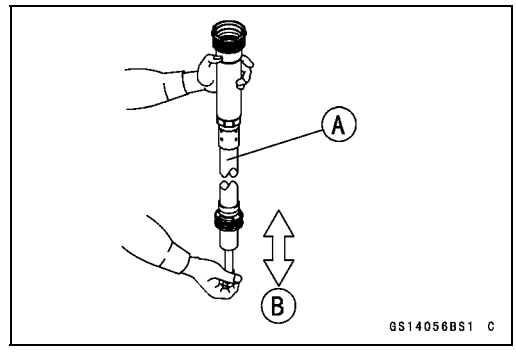


● Hold the fork cylinder unit [A] upright with the piston rod fully stretched.
● Plug the two oil holes [B]on the cylinder unit with fingers.
● Pour 193 mL (6.53 US oz.) of specified oil.

Recommended Oil
SHOWA SS-05 or equivalent



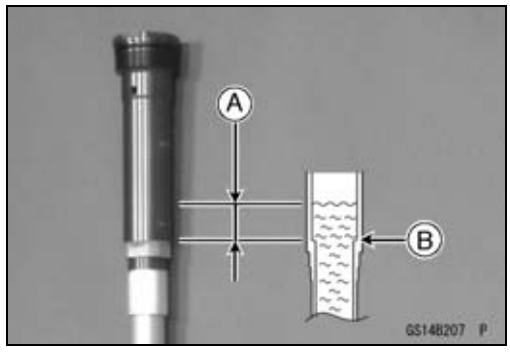
● Purge the air from the fork cylinder [A] by gently moving [B] the piston rod up and down several times.



Front Fork

● With the piston rod fully stretched, check the oil level [A] in the fork cylinder unit.
○Measure the oil level from the step [B] in the cylinder unit using the suitable gauge.

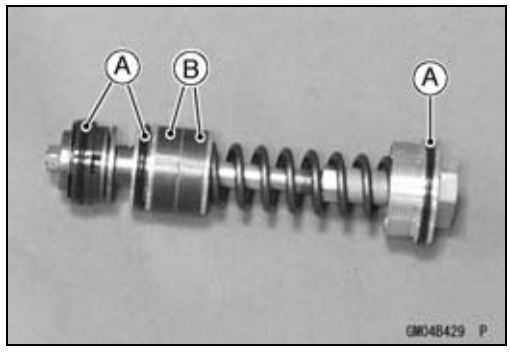
Fork Cylinder Unit Oil Level
42 ~ 49 mm (1.65 ~ 1.93 in.)



● Replace the O-ring [A] on the base valve assembly with new ones.
● Apply fork oil to the O-rings and bushings [B].

CAUTION

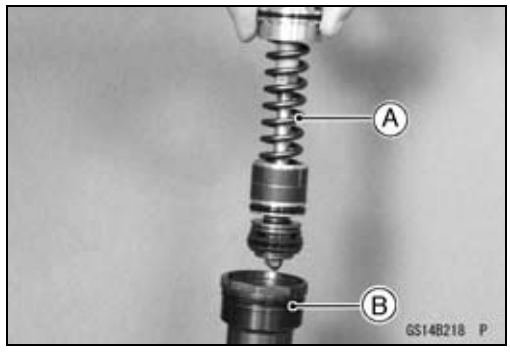
Do not damage the bushings when assembling the base valve.



● With the piston rod held immovable fully stretched, gently install the base valve assembly [A] to the fork cylinder unit [B].

NOTE

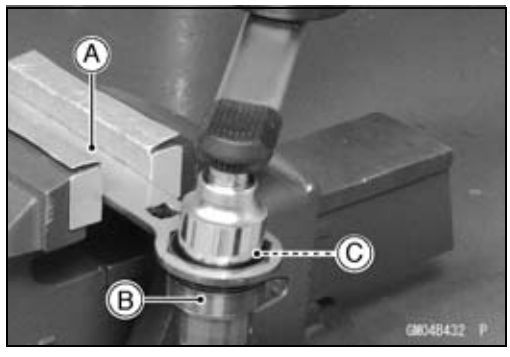
○*If there is difficulty in assembling the base valve, it may be because the oil level is too high. Check the oil level in the fork cylinder unit.*



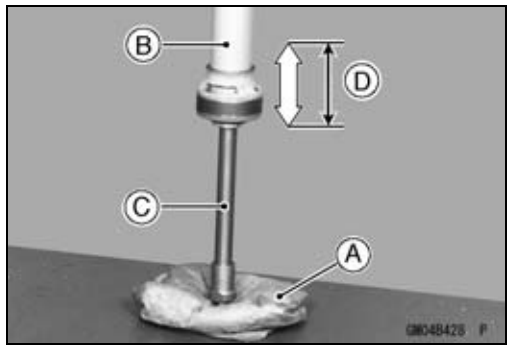
● Hold the top plug wrench [A] with a vise.
● Holding the fork cylinder unit [B] with the top plug wrench.
● Tighten the base valve assembly [C].

Special Tool - Top Plug Wrench, 50 mm: 57001-1645

Torque - Front Fork Base Valve Assembly: 29 N·m (3.0 kgf·m, 22 ft·lb)

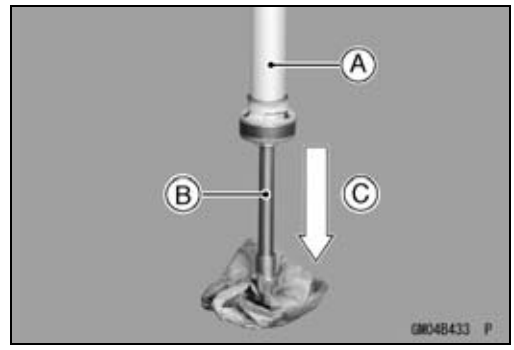


● Turn the locknut fully in.
● Apply fork oil to the piston rod sliding surface.
● Protect the piston rod end with a heavy cloth [A] to prevent thread damage.
● Hold the cylinder unit [B] at the up right position.
● Slowly pump the piston rod [C] several times about 100 mm [D].



Front Fork

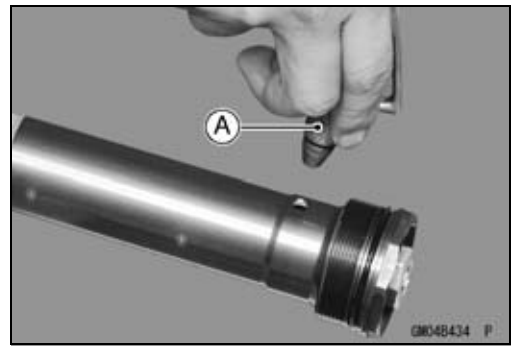
● Discharge the extra oil off the cylinder unit [A] by pumping the piston rod [B] to full stroke [C].



CAUTION

Be careful not to bend or damage the piston rod when the piston rod is stroked. Service carefully because oil files out from the oil hole of the cylinder unit.

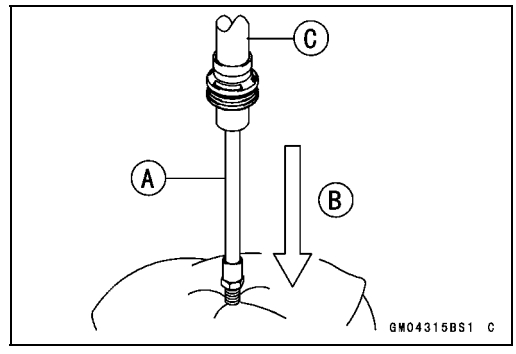
● Check the compression damping force setting to the softest.
● Check the piston rod sliding surface for damage.
● Drain the extra oil from the cylinder unit oil hole.
● Blow out the extra oil from the oil hole of the cylinder unit with the compressed air [A] blow to the oil hole.
● Wipe the oil off completely from the cylinder unit.



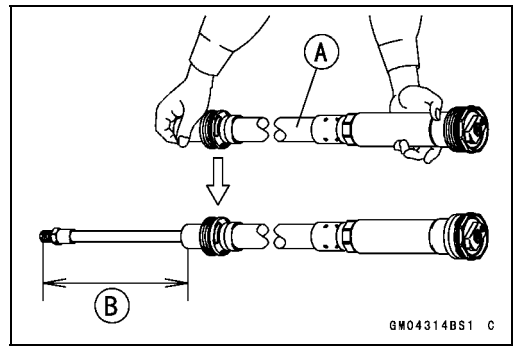
NOTE

○*If you cannot use compressed air, remove the pressure relief screw of the fork cap. Up side down the fork cylinder unit for 10 minutes and drain the oil from the cylinder unit. Reinstall the pressure relief screw.*

● Protect the piston rod end with a heavy cloth to prevent damage.
● Pump the piston rod [A] to full stroke [B] by pushing down the fork cylinder unit [C].
● Check the piston rod for smooth operation.
★If the piston rod operation is not smooth, check the piston rod for bend or damage.



● Hold the fork cylinder unit on level ground [A] while piston rod is full stroked by your hand.
● Release the piston rod then check the piston rod extend to maximum [B].
★If the piston rod does not extend to maximum, bleed the cylinder unit again.

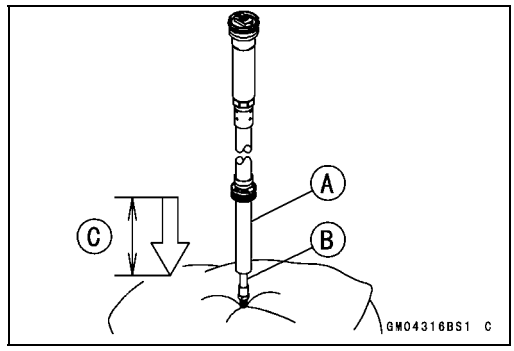


CAUTION

Be careful not to bend or damage the piston rod when the piston rod is stroked.

Front Fork

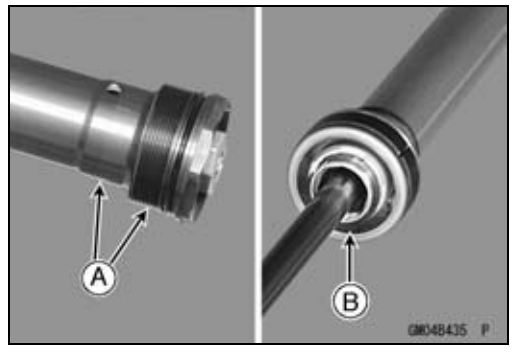
- Wipe the oil off completely from the cylinder unit [A].
- Compress the piston rod [B] to 200 ~ 250 mm (7.9 ~ 9.8 in.) [C] and hold the cylinder unit upright position for 10 minutes.



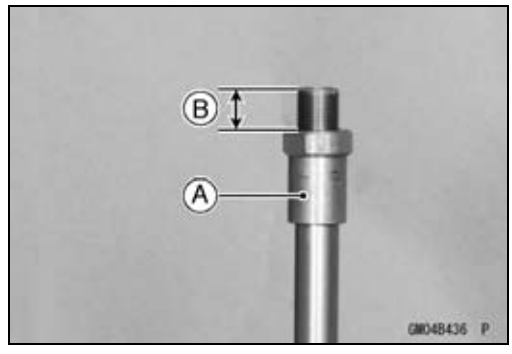
- There should be no oil leak from the base valve assembly part [A] or bottom [B] of the cylinder.

★If oil leaks from the base valve assembly part or bottom of the cylinder, replace the cylinder unit.

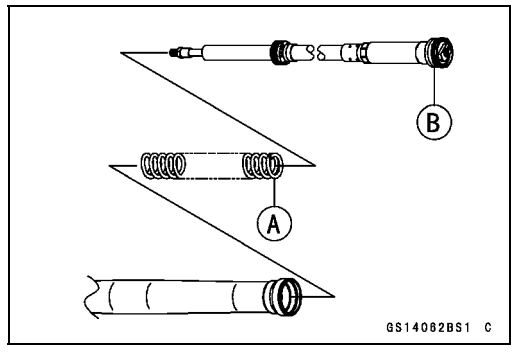
- Hold the cylinder unit on level ground and release the piston rod then check the piston rod extend to maximum.



- Tighten the locknut [A] fully and measure 10 ~ 12 mm [B] as shown.



- Completely wipe off the fork oil from the spring and fork cylinder unit.
- Install:
  Spring [A]
  Fork Cylinder Unit [B]



- Temporarily tighten the fork cylinder unit using the top plug wrench.

Special Tool - Top Plug Wrench, 50 mm: 57001-1645

- Holding the axle holder part with a vise.

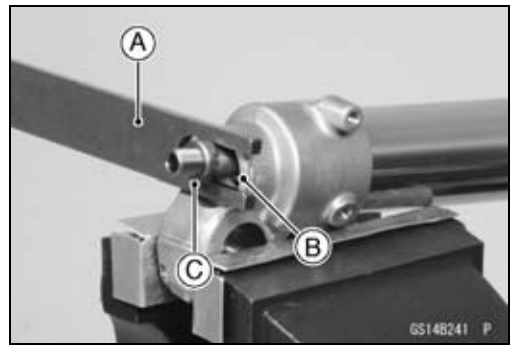
○Protect the axle holder part with a soft jaw or heavy cloth when using a vise.

⚠ WARNING

Clamping the axle holder part too tight can damage it which will affect riding stability. Do not clamp the axle holder part too tight.

Front Fork

- Compress the outer tube by hands and insert the top plug wrench [A] between the axle holder part bottom [B] and locknut [C].



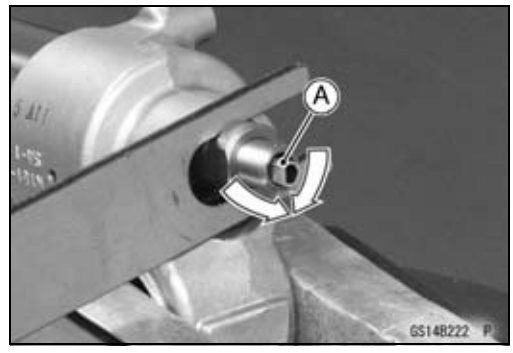
⚠ WARNING

Be careful of reaction force in spring and fix surely so that special tool should not come off. Do not place the fingers etc. while serving.

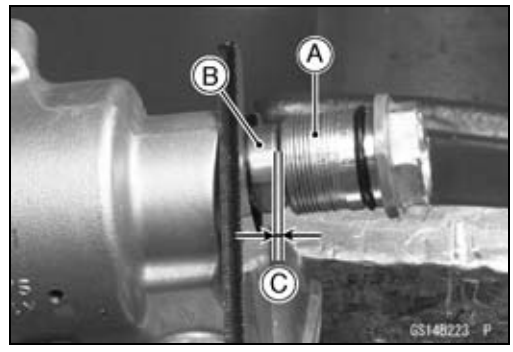
- Insert the push rod [A] into the piston rod.

NOTE

○*Check the push rod installation with its click by turning the push rod right and left.*



- Replace the O-ring with new one and apply specified fork oil to the O-ring.
- Slowly turn the adjuster assembly [A] clockwise until resistance is felt and check the clearance between the locknut [B] and adjuster assembly for more than 1 mm (0.14 in.) [C].

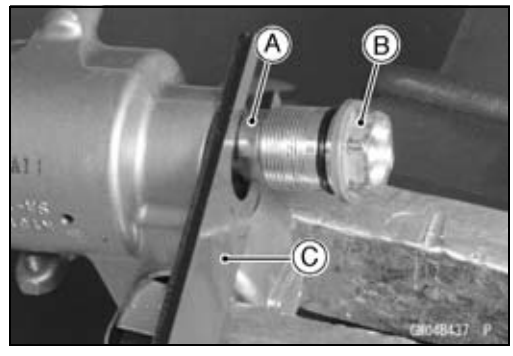


- Turn the locknut [A] counterclockwise until it contacts with the adjuster assembly [B].
- With the locknut held immovable using a wrench, tighten the adjuster assembly.

Torque - Adjuster Assembly Locknut: 22 N·m (2.2 kgf·m, 16 ft·lb)

- Apply a non-permanent locking agent to the adjuster assembly.
- With the outer tube compressed by hands, remove the top plug wrench [C].

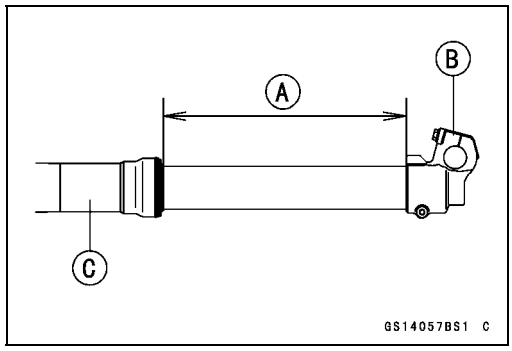
Torque - Front Fork Adjuster Assembly: 69 N·m (7.0 kgf·m, 51 ft·lb)



Front Fork

● Compare the length [A] at assembly and at disassembly.
○There should be same length.
★If the length at assembly is longer than at disassembly, check the adjuster assembly and locknut installation.
Axle Holder [B]
Outer Tube [C]

Length
Standard: 319 ±2 mm (12.6 ±0.08 in.)



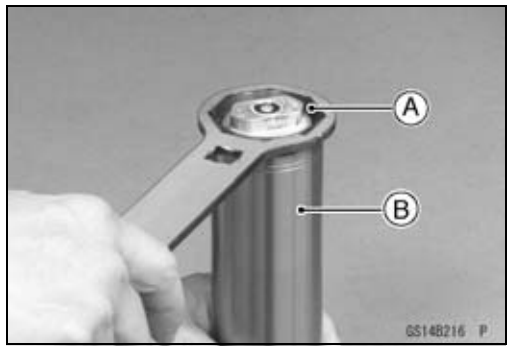
● Using the top plug wrench, unscrew the fork cylinder unit.
● Pour the specified amount of fork oil into the outer tube.

Recommended Oil
SHOWA SS-05 or equivalent
Oil Capacity (in outer tube)

Standard:	**360 ±2.5 mL (12.2 ±0.08 US oz.) (KX250T6F)** **373 ±2.5 mL (12.6 ±0.08 US oz.) (KX250T7F)** **374 ±2.5 mL (12.6 ±0.08 US oz.), 371 ±2.5 mL (12.5 ±0.08 US oz.) (Europe Model) (KX250T8F)**
Adjustable Range:	**322 ~ 417 mL (11.0 ~ 14.1 US oz.) (KX250T6F)** **324 ~ 419 mL (10.9 ~ 14.2 US oz.) (KX250T7F)** **319 ~ 415 mL (10.8 ~ 14.0 US oz.) (KX250T8F)**

● Raise the outer tube [B] and temporarily install the cylinder unit to the outer tube using the top plug wrench [A].

Special Tool - Top Plug Wrench, 50 mm: 57001-1645



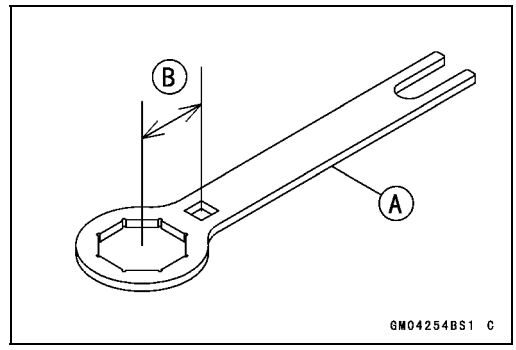
● Install the front fork.
● Tighten the front fork lower clamp bolts.

Torque - Front Fork Clamp Bolts (Lower): 20 N·m (2.0 kgf·m, 14.5 ft·lb)

Front Fork

The torque of fork cylinder unit is specified to 34 N·m (3.5 kgf·m, 25 ft·lb) however, when you use the top plug wrench [A], reduce the torque to 90% of the specified value [31 N·m (3.1 kgf·m, 23 ft·lb)] due to the distance between the center of the square hole [B], where the torque wrench [C] is fitted, and that of the octagonal hole of the wrench.

This torque value [31 N·m (3.1 kgf·m, 23 ft·lb)] is applicable when you use a torque wrench whose length gives lever-age of approximately 310 mm between the grip point to the center of the coupling square.

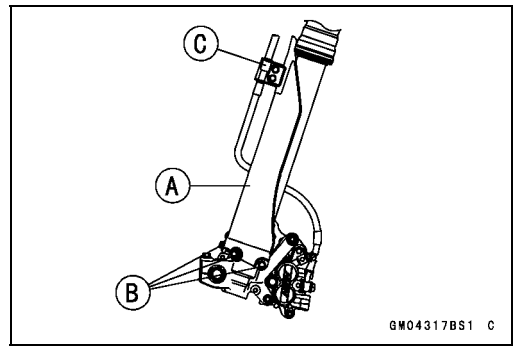


- Apply a non-permanent locking agent to the upper clamp bolts.

Torque - Front Fork Cylinder Unit: 34 N·m (3.5 kgf·m, 25 ft·lb)
Front Fork Clamp Bolts (Upper): 20 N·m (2.0 kgf·m, 14.5 ft·lb)

- Install:
  Front Wheel (see Front Wheel Installation in the Wheels/Tires chapter)
  Front Brake Caliper (see Caliper Installation in the Brakes chapter)

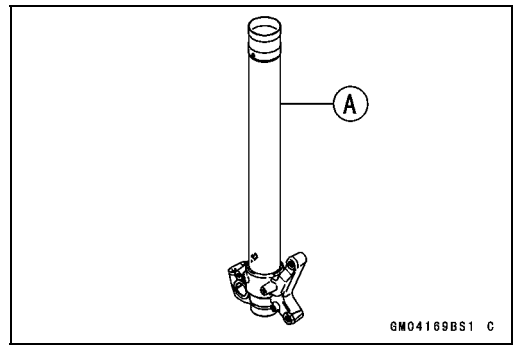
- Install:
  Front Fork Protector [A]
  Bolts [B]
  Front Brake Hose Clamps [C] (left front fork only)
- Set the damping adjusters to the position recorded before removing the front fork.



Inner Tube Inspection

- Visually inspect the inner tube [A], repair any damage.
- Nick or rust damage can sometimes be repaired by using a wet-stone to remove sharp edges or raised areas which cause seal damage.

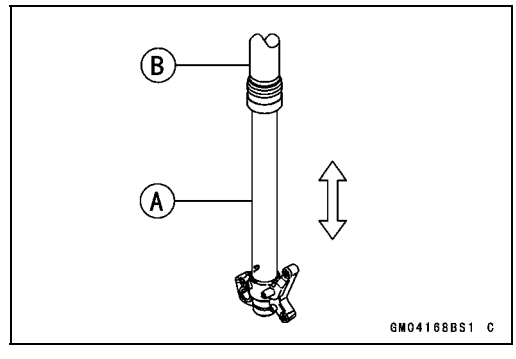
★If the damage is not repairable, replace the inner tube. Since damage to the inner tube damages the oil seal, replace the oil seal whenever the inner tube is repaired or replaced.



- Temporarily assemble the inner [A] and outer tubes [B], and pump them back and forth manually to check for smooth operation.

CAUTION

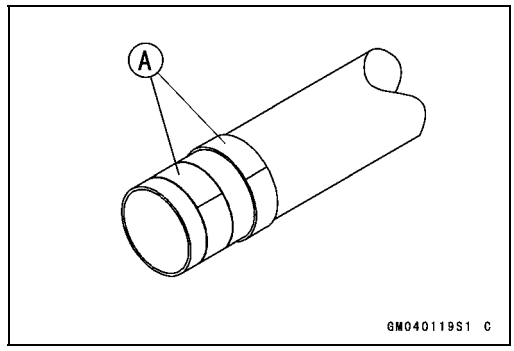
If the inner tube is badly bent or creased, replace it. Excessive bending, followed by subsequent straightening, can weaken the inner tube.



Front Fork

Slide/Guide Bushing Inspection

- Visually inspect the guide bushing [A], and replace them if necessary.

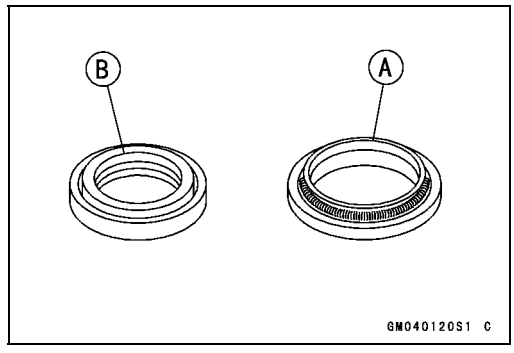


Dust Seal/Oil Seal Inspection

- Inspect the dust seal [A] for any signs of deterioration or damage.

★Replace it if necessary.

- Replace the oil seal [B] with a new one whenever it has been removed.



Spring Tension Inspection

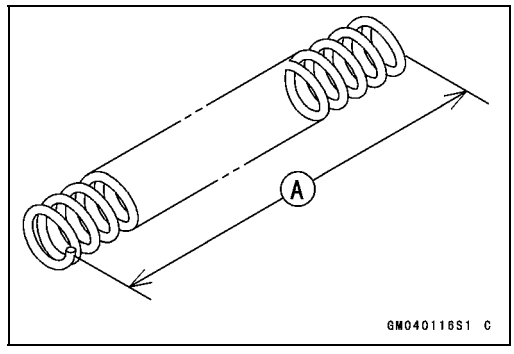
- Since a spring becomes shorter as it weakens, check its free length [A] to determine its condition.

★If the spring of either fork leg is shorter than the service limit, it must be replaced. If the length of a replacement spring and that of the remaining spring vary greatly, the remaining spring should also be replaced in order to keep the fork legs balanced from motorcycle stability.

Fork Spring Free Length

Standard: 495 mm (19.5 in.)

Service Limit: 485 mm (19.09 in.)



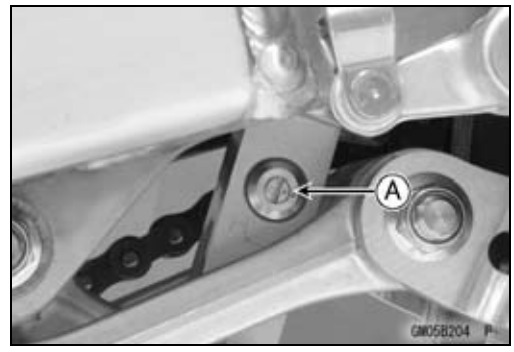
Rear Shock Absorber

To suit to various riding conditions, the spring preload of the shock absorber can be adjusted or the spring can be replaced with an optional one. Also the damping force can be adjusted easily so changing oil viscosity unnecessary.

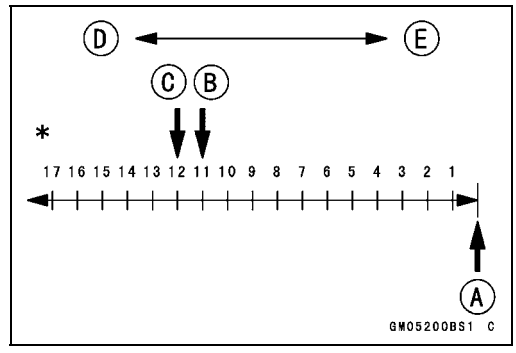
Rebound Damping Adjustment

- Turn the rebound damping adjuster [A] on the rear shock absorber lower end with the blade of a screwdriver until you feel a click.

★If the damper setting feels too soft or too stiff, adjust it in accordance with the following table:



Seated position: adjuster turned fully clockwise [A].



Rebound Damping Adjuster Setting

Standard: 11 clicks [B], 12 clicks [C] (Europe Model) (KX250T6F)

11 clicks (KX250T7F)

10 clicks, 11 clicks (Europe Model) (KX250T8F)

Softer (Counterclockwise) [D]

Harder (Clockwise) [E]

*: Number of turns counterclockwise usable range - 17 or more.
Counterclockwise from the fully seated position.

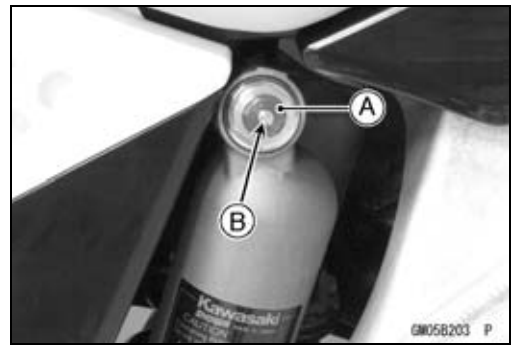
NOTE

○*Adjustment of the rebound damping adjuster for the rear suspension will slightly affect the compression damping force. Always make any damping adjustments in small steps and test their effects before using them in competition.*

Compression Damping Adjustment

There are two adjustments you can make to the rear shock absorber gas reservoir.

High Speed Compression Damping Adjuster [A]
Low Speed Compression Damping Adjuster [B]

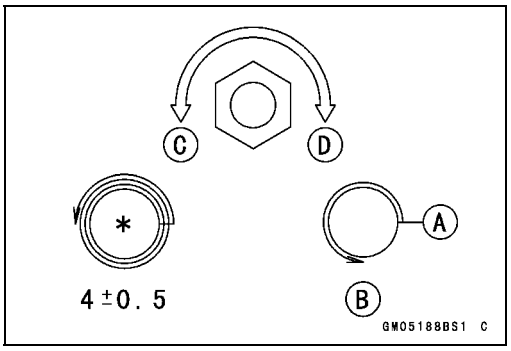


Rear Shock Absorber

● Adjust the high speed compression damping, turn the high speed compression damping adjuster with a 17 mm wrench.

★If the damping feels too soft or too stiff, adjust it in accordance with the following table.

Seated position: adjuster turned fully clockwise [A].



High Speed Compression Damping Adjuster Setting

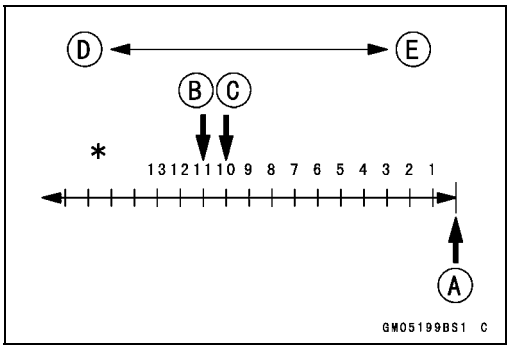
Standard: 1 3/4 turns out [B] (KX250T6F)
2 turns out (KX250T7F)
2 1/3 turns out,
2 1/2 turns out (Europe Model) (KX250T8F)
Softer (counterclockwise) [C]
Harder (clockwise) [D]

*: Number of turns counterclockwise usable range - 3 1/2 or more.
Counterclockwise from the fully seated position.

● Adjust the low speed compression damping, turn the low speed compression damping adjuster with a flat-head screwdriver.

★If the damping feels too soft or too stiff, adjust it in accordance with the following table.

Seated position : adjuster turned fully clockwise [A].



Low Speed Compression Damping

Standard: 11 clicks [B], 10 clicks (Europe Model) [C] (KX250T6F)
10 clicks (KX250T7F)
10 clicks, 11 clicks (Europe Model) (KX250T8F)
Softer (counterclockwise) [D]
Harder (clockwise) [E]

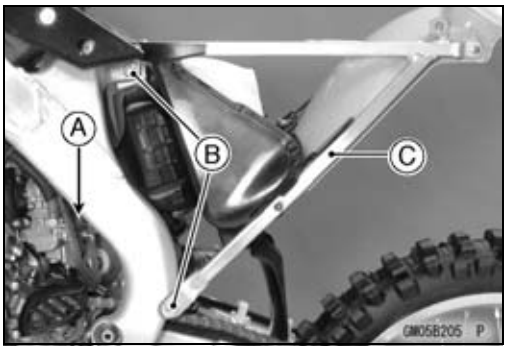
*: Number of turns counterclockwise usable range - 13 or more.
Counterclockwise from the fully seated position.

NOTE

○*Adjustment of the rebound damping adjusters for the rear suspension will slightly affect the compression damping force. Always make any damping adjustments in small steps and test their effects before using them in competition.*

Spring Preload Adjustment

● Remove:
Seat (see Seat Removal in the Frame chapter)
Side Covers (see Side Cover Removal in the Frame chapter)
Muffler Body (see Muffler Removal in the Engine Top End chapter)
Carburetor Holder Clamp Screw [A] (loosen)
Rear Frame Mounting Bolts [B]
Rear Frame [C] with Air Cleaner Housing



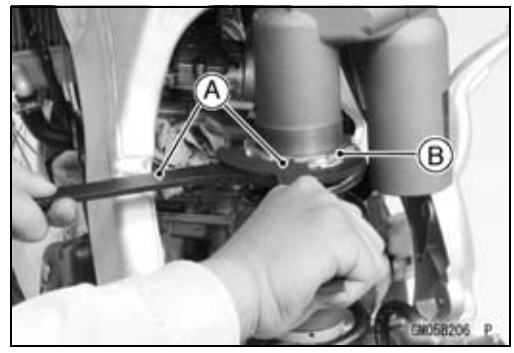
Rear Shock Absorber

- Using the jack under the frame, raise the rear wheel off the ground.

Special Tools - Jack: 57001-1238
Jack Attachment: 57001-1252 or 57001 -1608

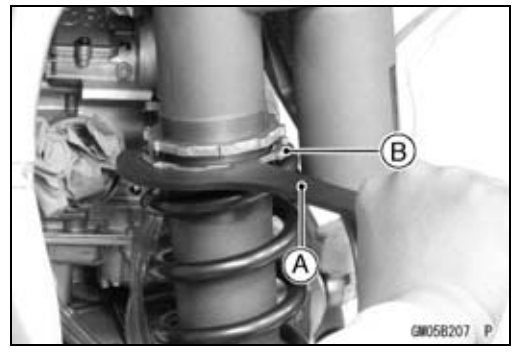
- Using the hook wrenches [A], loosen the locknut [B] on the rear shock absorber.

Special Tools - Hook Wrench R37.5, R42: 57001-1101
Hook Wrench T=3.2 R37: 57001-1539



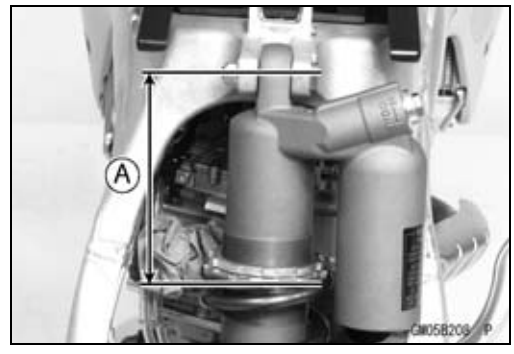
- Using the hook wrench [A], turn the adjusting nut [B] as required. Turning the adjusting nut downward marks the spring action harder and upward softer.

Special Tool - Hook Wrench R37.5, R42: 57001-1101



Spring Preload Adjustment
(Adjusting nut position at the lower surface [A] from the center of the mounting hole)

Standard:	**123.5 mm (4.862 in.), 125.3 mm (4.933 in.) (Europe Model) (KX250T6F)**
	127.9 mm (5.035 in.) (KX250T7F) 129.1 mm (5.083 in.), 128.6 mm (5.063 in.) (Europe Model) (KX250T8F)
Adjustable Range:	**122.1 ~ 131.6 mm (4.807 ~ 5.181 in.) (KX250T6F) 125.8 ~ 133.8 mm (KX250T7F ~) (4.953 ~ 5.268 in.)**



- Tighten the locknut securely.

Torque - Rear Shock Absorber Spring Locknut: 45 N·m (4.6 kgf·m, 3.3 ft·lb)

- After adjusting, move the spring up and down to make sure that the spring is seated.
- Install the parts removed.
- Tighten the rear frame mounting bolts.

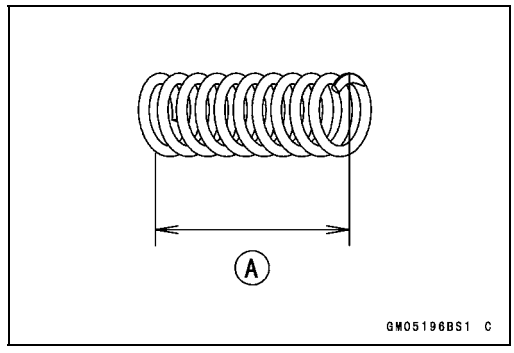
Torque - Rear Frame Mounting Bolts: 34 N·m (3.5 kgf·m, 25 ft·lb)

Rear Shock Absorber

Spring Tension Inspection

- Since the spring becomes shorter as it weakens, check its free length [A] to determine its condition.

★If the spring of either rear shock absorber is shorter than the service limit, it must be replaced. If the length of replacement spring and that of the remaining spring vary greatly, the remaing spring should also be replaced in order to keep the rear shock absorbers balanced of motorcycle stability.



Shock Absorber Spring Free Length
Standard: 265 mm (10.43 in.)
Service Limit: 260 mm (10.24 in.)

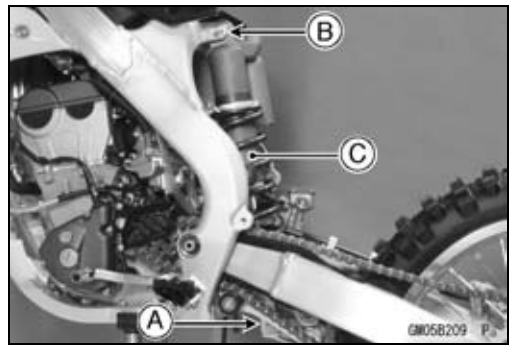
Rear Shock Absorber Removal

- Remove:
  Seat (see Seat Removal in the Frame chapter)
  Side Covers (see Side Cover Removal in the Frame chapter)
  Muffler Body (see Muffler Removal in the Engine Top End chapter)
  Rear Frame with Air Cleaner Housing (see Spring Preload Adjustment)
- Using the jack under the frame, raise the rear wheel off the ground.

Special Tools - Jack: 57001-1238
Jack Attachment: 57001-1252 or 57001-1608

CAUTION

When pulling out the mounting bolts, lift the rear wheel slightly. Forcing or tapping on a bolt could damage the bolt, sleeve, and bearing



- Remove the rear shock absorber lower mounting bolt [A].
- Remove the rear shock absorber upper mounting bolt [B], nut, and pull out the rear shock absorber [C].

Rear Shock Absorber Installation

- Pack the rocker arm needle bearings with grease.
- Tighten the following:

Torque - Rear Shock Absorber Mounting Nut (Upper): 39 N·m (4.0 kgf·m, 29 ft·lb)
Rear Shock Absorber Mounting Nut (Lower): 34 N·m (3.5 kgf·m, 25 ft·lb)
Rear Frame Mounting Bolts: 34 N·m (3.5 kgf·m, 25 ft·lb)

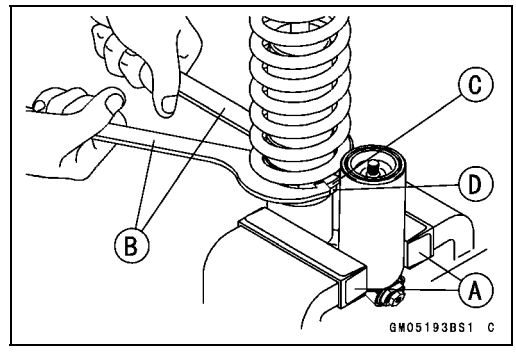
Rear Shock Absorber

Rear Shock Absorber Spring Replacement

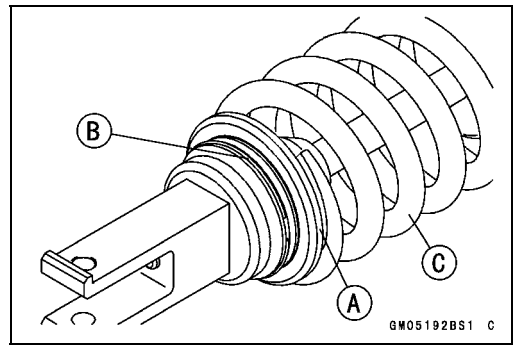
In addition to the standard spring, heavy and light springs are available. If the standard spring is improper for your purpose, select a proper one according to the rider's weight or course conditions.

- Remove:
  Rear Shock Absorber (see Rear Shock Absorber Removal)
- Clean the threaded portion on the upper of the rear shock absorber.
- Hold the upper end of the rear shock absorber in a vise with soft jaws [A] or a heavy cloth.
- Using the hook wrenches [B], loosen the locknut [C] and turn the adjusting nut [D] all way up.

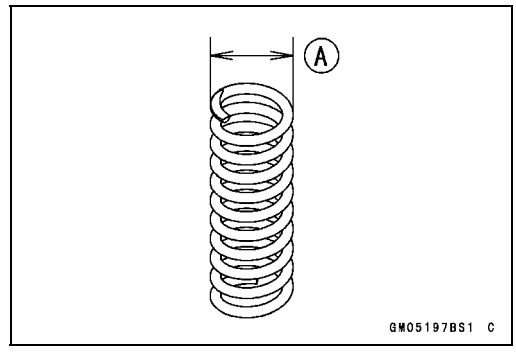
Special Tools - Hook Wrench R37.5, R42: 57001-1101
Hook Wrench T=3.2 R37: 57001-1539



- Remove the rear shock absorber from the vise.
- Slide the spring seat [A].
- Remove the circlip [B] from the shock absorber and lift off the spring seat and spring [C].



- Exchange the spring for an optional part. Install the spring so that large diameter end [A] faces upward.
- Install the spring seat.
- Adjust the spring preload (see Spring Preload Adjustment).
- Install the rear shock absorber.
- Install the parts removed.



Rear Shock Absorber Disassembly (Oil Change)

- Refer to the Rear Shock Absorber Oil Change in the Periodic Maintenance chapter.

Rear Shock Absorber Assembly

- Refer to the Rear Shock Absorber Oil Change in the Periodic Maintenance chapter.

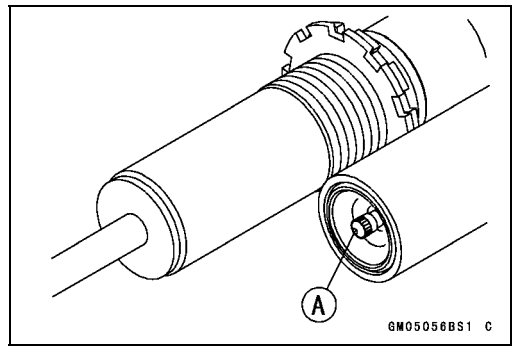
Rear Shock Absorber

Rear Shock Absorber Scrapping

⚠ WARNING

Since the reserve tank of the rear shock absorber contains nitrogen gas, do not incinerate the reserve tank without first releasing the gas or it may explode.

- Remove the shock absorber (see Rear Shock Absorber Removal).
- Remove the valve cap [A] and release the nitrogen gas completely from the gas reservoir.
- Remove the valve.



⚠ WARNING

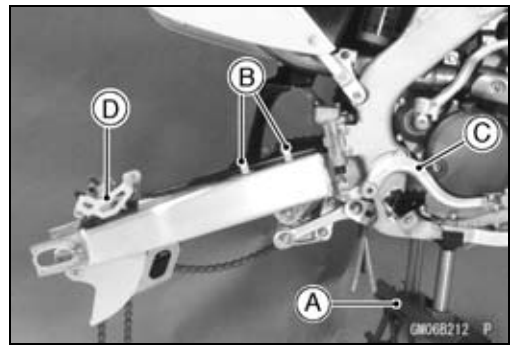
Since the high pressure gas is dangerous, do not point the valve toward your face or body.

Swingarm

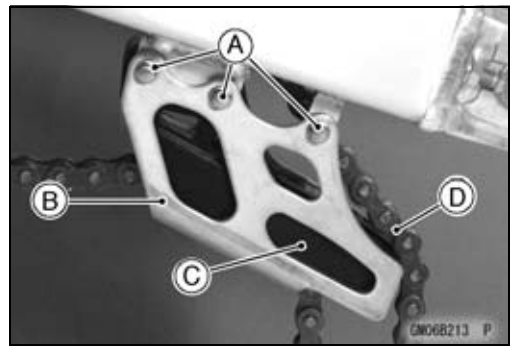
Swingarm Removal

- Place the jack [A] under the frame so that the rear wheel is off the ground.

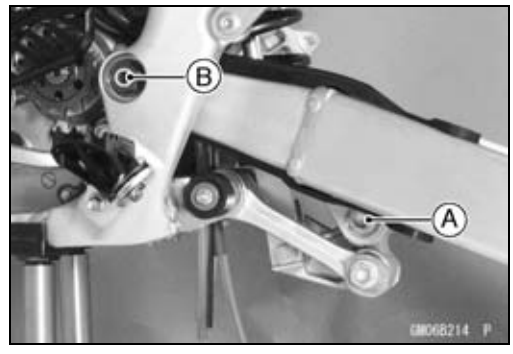
Special Tools - Jack: 57001-1238
Jack Attachment: 57001-1252 or 57001 -1608



- Remove
  Rear Wheel (see Rear Wheel Removal in the Wheels/Tires chapter)
  Clamps [B]
  Brake Pedal [C] (see Brake Pedal Removal in the Brakes chapter)
  Caliper Assembly [D]



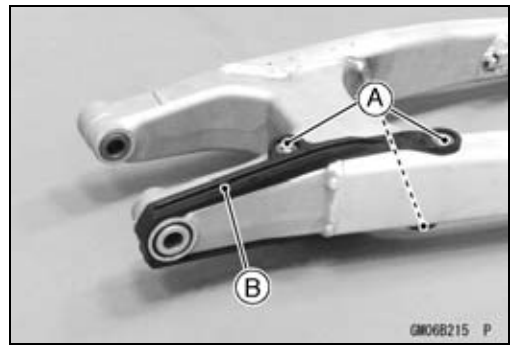
- Remove:
  Bolts [A]
  Chain Guide Plate [B]
  Chain Guide [C]
  Drive Chain [D]



- Unscrew the rocker arm mounting nut and pull out the rocker arm bolt [A].
- Unscrew the nut [B].
- Pull out the swingarm pivot shaft, and remove the swingarm.

CAUTION

When pulling out the mounting bolts, lift the swingarm slightly. Forcing or tapping on a bolt could damage the bolt, sleeve, and bearing.



- Unscrew the screws [A]
- Separate the chain slipper [B] from the swingarm.

Swingarm

Swingarm Installation

- Apply plenty of grease to the inside of the needle bearings, sleeves, and oil seals.
- Tighten the following:

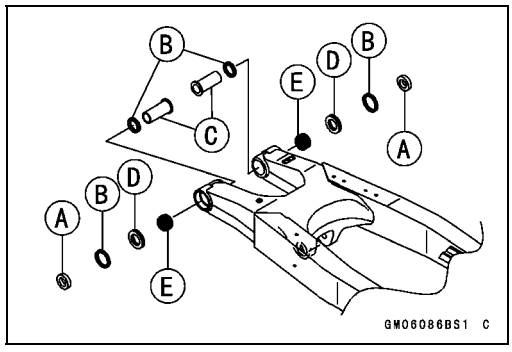
Torque - Swingarm Pivot Shaft Nut: 98 N·m (10 kgf·m, 72 ft·lb)
Rocker Arm Pivot Nut: 83 N·m (8.5 kgf·m, 61 ft·lb) (KX250T6F)
Rocker Arm Pivot Nut: 59 N·m (6.0 kgf·m, 44 ft·lb) (KX250T7F ~)

- Refer to the Rear Wheel Installation in the Wheels/Tires chapter for wheel installing.

Swingarm Bearing Removal

- Remove:
  Swingarm
  Collars [A]
  Grease Seals [B]
  Sleeves [C]
  Needle Bearings [D]
- Remove the needle bearings [E] using the oil seal & bearing remover.

Special Tool - Oil Seal & Bearing Remover: 57001-1058



Swingarm Bearing Installation

- Replace the needle bearings and, grease seals with new ones.
- Apply plenty of grease to the grease seals, and needle bearings [A] [B].

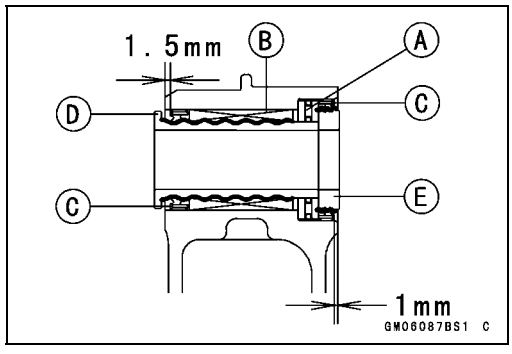
NOTE

○*Install the needle bearings so that the manufacturer's marks face out.*
○*Install the grease seals so that the deep groove side of the rip in-ward.*

Special Tool - Bearing Driver Set: 57001-1129

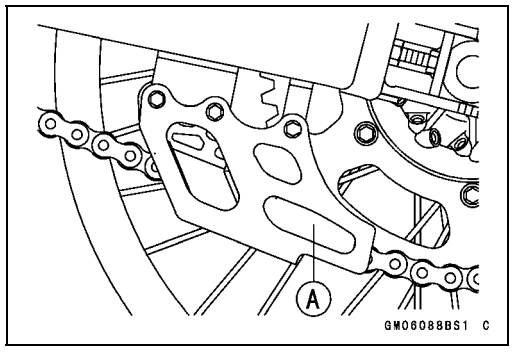
- Install the needle bearings [A], [B], grease seals [C], sleeves [D] and collars [E] position as shown.

○The installation procedure is the same as the counter side.



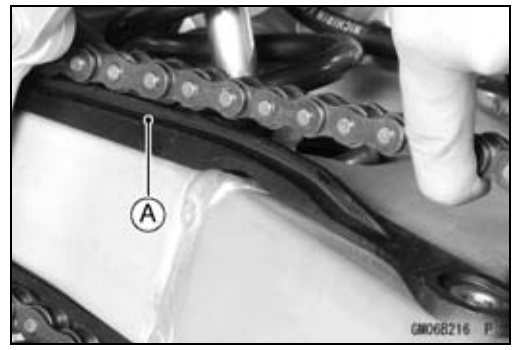
Drive Chain Guide, Guide Roller, Chain Slipper Wear Inspection

- Visually inspect the drive chain guide [A] and replace it if excessively worn or damaged.

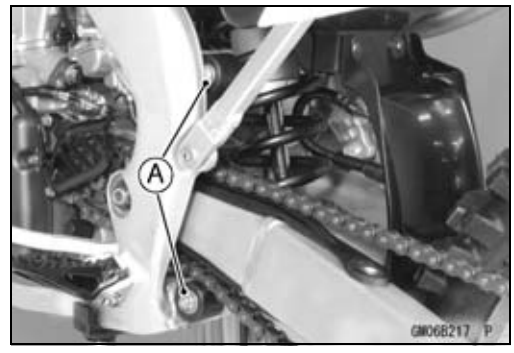


Swingarm

● Visually inspect the chain slipper [A] on the swingarm and replace it if worn or damaged.

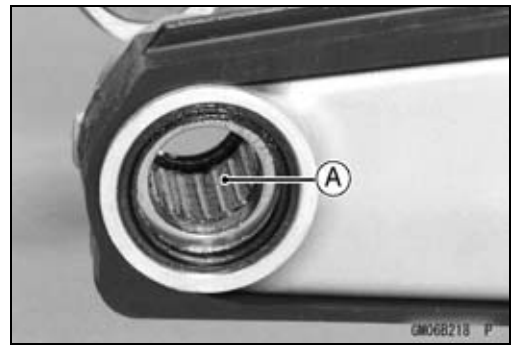


● Visually inspect the upper and lower chain guide rollers [A] and replace them if excessively worn or damaged.



Swingarm Bearing, Sleeve Inspection

CAUTION
Do not remove the bearings for inspection. Removal may damage them.



● Inspect the needle bearings [A] installed in the swingarm.
○The rollers in a bearing normally wear very little, and wear is difficult to measure. Instead of measuring, visually inspect the bearing for abrasion, discoloration, or other damage.
★If the needle bearing, and sleeve show any sings of abnormal wear, discoloration, or damage, replace them as a set.

Tie-Rod, Rocker Arm

Tie-Rod Removal

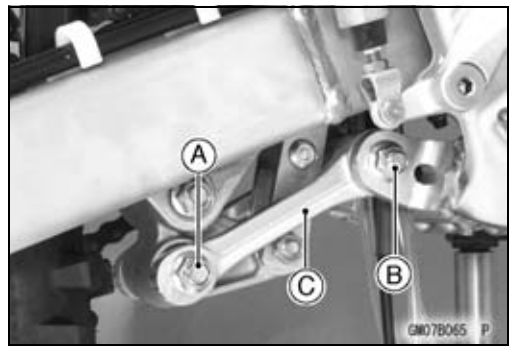
- Using the jack under the frame, raise the rear wheel off the ground.

Special Tools - Jack: 57001-1238
Jack Attachment: 57001-1252 or 57001 -1608

CAUTION

When pulling out the mounting bolts, lift the rear wheel slightly. Forcing or tapping on a bolt could damage the bolt, sleeve, and bearing.

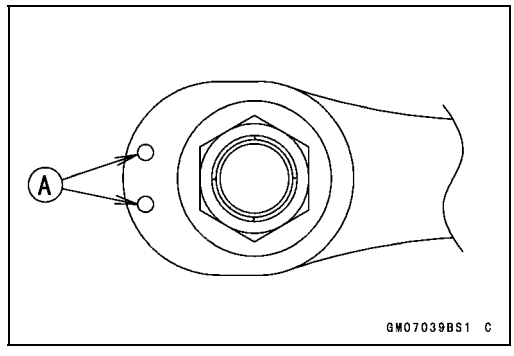
- Remove the tie-rod rear mounting bolt [A].
- Remove the tie-rod front mounting bolt [B], and then take out the tie-rod [C].



Tie-Rod Installation

- Apply plenty of grease to the inside of the oil seals.
- Install the tie-rod so that the circle marks [A] face right side.
- Be sure seated the washers.
- Tighten the tie-rod front and rear mounting nuts.

Torque - Tie-Rod Mounting Nuts (KX250T6F): 83 N·m (8.5 kgf·m, 61 ft·lb)
Tie-Rod Mounting Nuts (KX250T7F ~): 59 N·m (6.0 kgf·m,44 ft·lb)



Rocker Arm Removal

- Using the jack under the frame, raise the rear wheel off the ground.

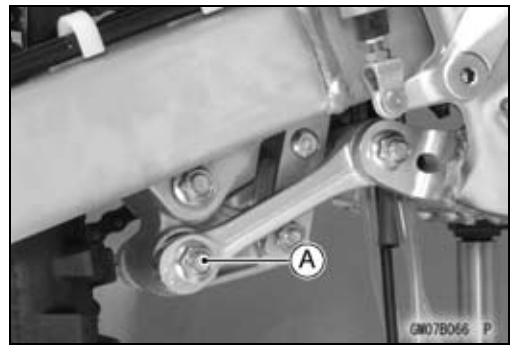
Special Tools - Jack: 57001-1238
Jack Attachment: 57001-1252 or 57001 -1608

CAUTION

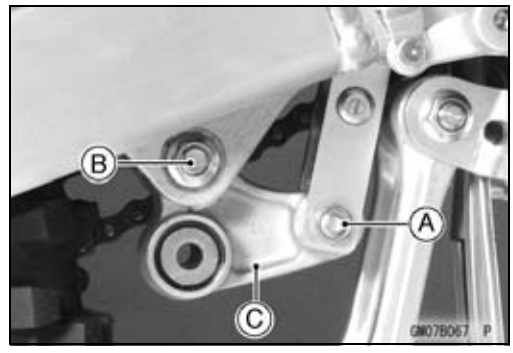
When pulling out the mounting bolts, lift the rear wheel slightly. Forcing or tapping on bolt could damage the bolt, sleeve, and bearing.

Tie-Rod, Rocker Arm

● Remove the tie-rod rear mounting bolt [A].



● Remove:
Rear Shock Absorber Lower Mounting Bolt [A]
Rocker Arm Pivot Shaft [B]
Rocker Arm [C]



Rocker Arm Installation

● Apply plenty of grease to the inside of the rocker arm, needle bearings, oil seals and grease seals outside of the sleeve.
● Be sure seated the washers.
● Tighten the following:

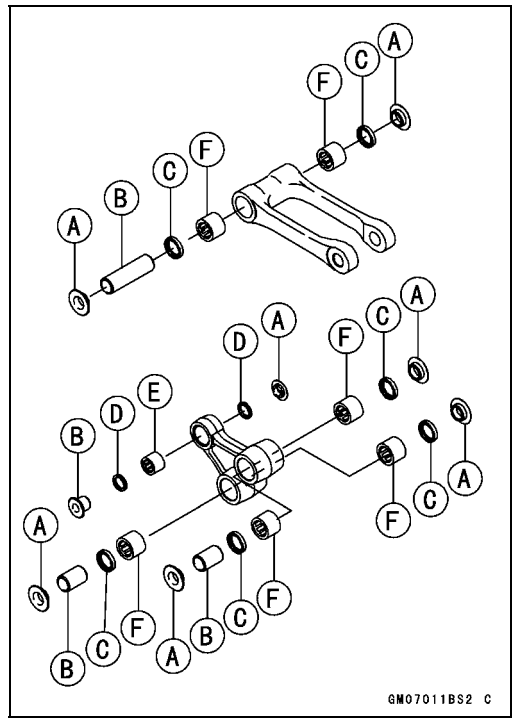
Torque - Rear Shock Absorber Mounting Nut (Lower): 34 N·m (3.5 kgf·m, 25 ft·lb)
Rocker Arm Pivot Nut: 83 N·m (8.5 kgf·m, 61 ft·lb) (KX250T6F)
Rocker Arm Pivot Nut: 59 N·m (6.0 kgf·m, 44 ft·lb (KX250T7F ~)
Tie-Rod Mounting Nuts: 83 N·m (8.5 kgf·m, 61 ft·lb) (KX250T6F)
Tie-Rod Mounting Nuts: 59 N·m (6.0 kgf·m, 44 ft·lb) (KX250T7F ~)

Tie-Rod, Rocker Arm

Tie-Rod and Rocker Arm Bearing Removal

- Remove:
  Tie-Rod (see Tie-Rod Removal)
  Rocker Arm (see Rocker Arm Removal)
  Washers [A]
  Sleeves [B]
  Oil Seals [C]
  Grease Seals [D]
- Remove the needle bearings [E], using the bearing remover head and bearing remover shaft.
- Remove the needle bearing [F], using the oil seal & bearing remover.

Special Tools - Bearing Remover Head: 57001-1267
Bearing Remover Shaft: 57001-1265
Oil Seal & Bearing Remover: 57001-1058



Tie-Rod and Rocker Arm Bearing Installation

- Replace the needle bearing, grease seals and oil seals with new ones.
- Apply plenty of grease to the oil seal and needle bearings.

NOTE

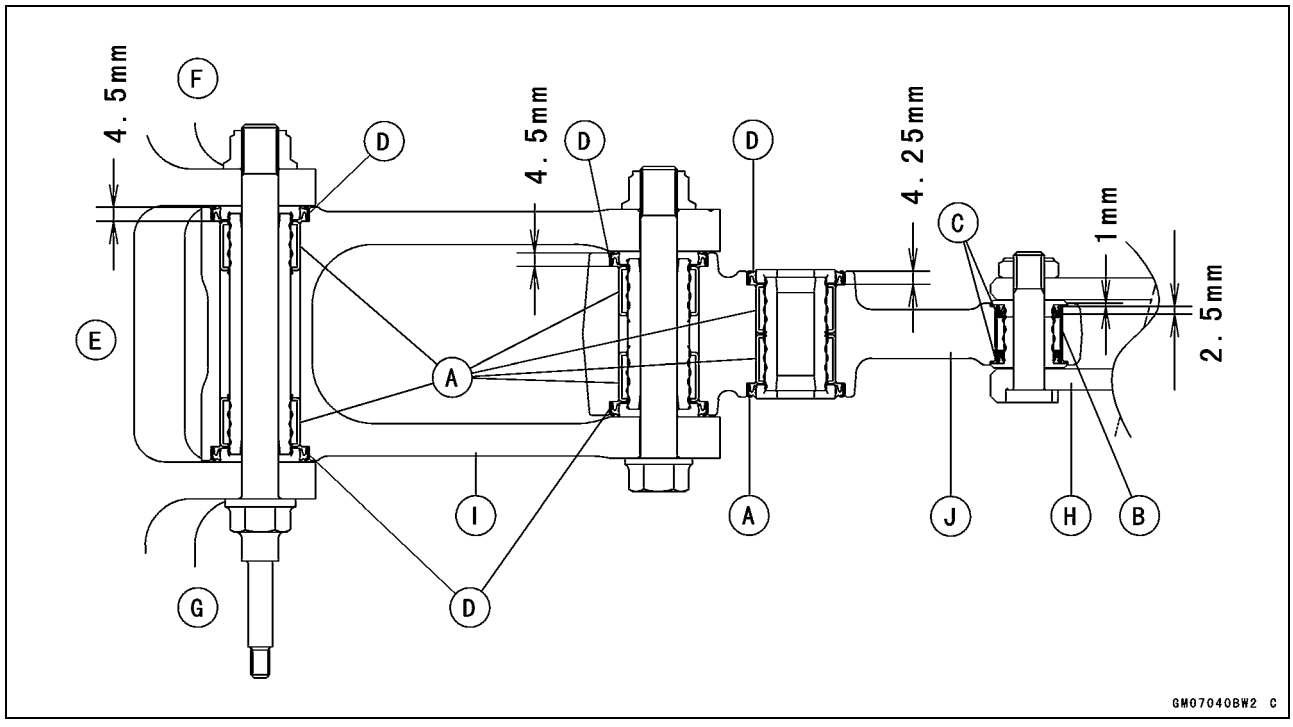
○*Install the grease seals so that the deep groove side of the rip out-ward.*

Tie-Rod, Rocker Arm

● Install the needle bearings [A], [B], grease seals [C], and oil seals [D] position as shown.

○The installation procedure is the same as the counter side.

Front [E]
Right Side [F]
Left Side [G]
Rear Shock Absorber [H]
Tie-rod [I]
Rocker Arm [J]



Needle Bearing Inspection

★If there is any doubt as to the condition of either needle bearing, replace the bearing and sleeve as a set.

Uni-Trak Maintenance

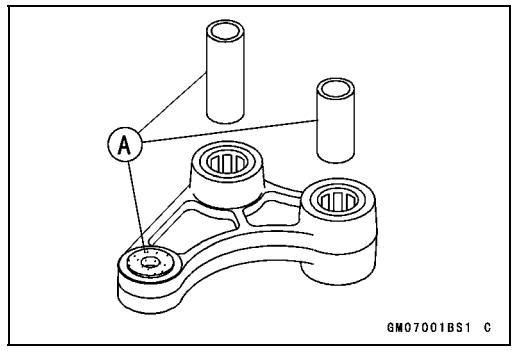
Uni-Trak Linkage Inspection

- Refer to the Uni-Trak Linkage Inspection in the Periodic Maintenance chapter.

Tie-Rod and Rocker Arm Sleeve Wear Inspection

- Pull out the sleeves [A] of the tie-rod and rocker arm.
- Measure the outside diameter of the sleeve.

★If the sleeve is worn past the service limit, replace the sleeve.



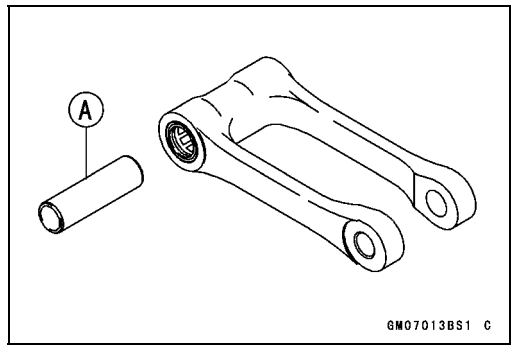
Sleeve Outside Diameter

Standard:

Tie-rod	**19.987 ~ 20.000 mm (0.7869 ~ 0.7874 in.)**
Rocker Arm:	
Large	**19.987 ~ 20.000 mm (0.7869 ~ 0.7874 in.)**
Small	**15.989 ~ 16.000 mm (0.6293 ~ 0.6299 in.)**

Service Limit:

Tie-rod	**19.85 mm (0.781 in.)**
Rocker Arm:	
Large	**19.85 mm (0.781 in.)**
Small	**15.85 mm (0.624 in.)**

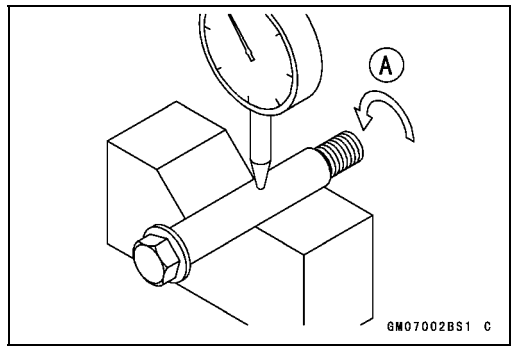


Tie-Rod and Rocker Arm Mounting Bolt Bend Inspection

A bent bolt causes vibration, poor handling, and instability.

- To measure the bolt runout, remove the bolt, place it in V blocks, and set a dial gauge to the bolt at a point halfway between the blocks. Turn [A] the bolt to measure the runout. The amount of dial variation is the amount of runout.

★If runout exceeds the service limit, replace the bolt.



Bolt Runout

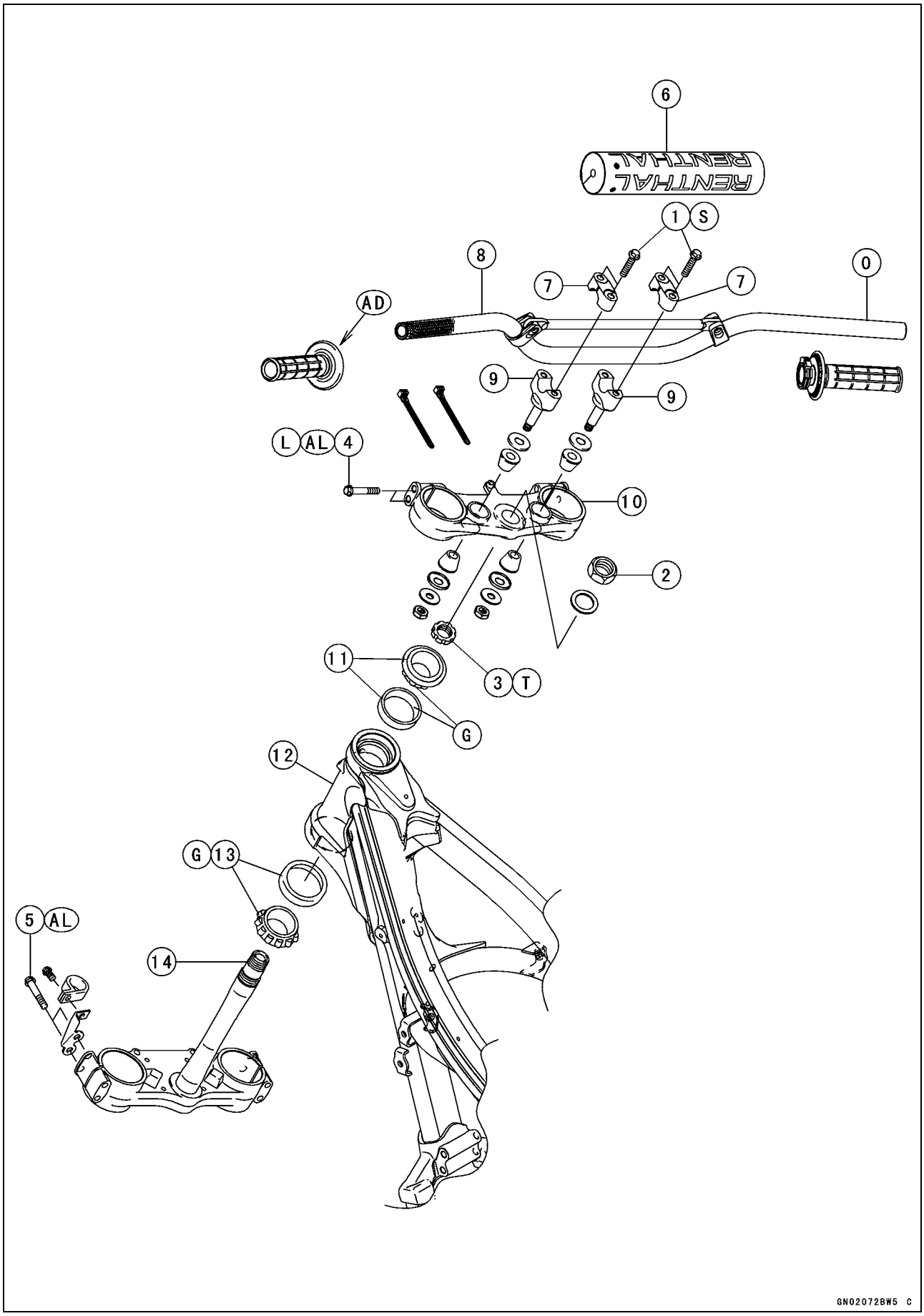
Standard:	**TIR 0.1 mm (0.004 in.) or less**
Service Limit:	**TIR 0.2 mm (0.008 in.)**

Steering

Table of Contents

Exploded View 14-2
Special Tools 14-4
Steering 14-6
  Steering Inspection 14-6
  Steering Adjustment 14-6
  Steering Stem, Stem Bearing Removal 14-6
  Steering Stem, Stem Bearing Installation 14-7
  Stem Bearing Lubrication 14-9
  Stem Bearing Wear, Damage Inspection 14-9
  Stem Warp Inspection 14-9
Handlebar 14-10
  Handlebar Removal 14-10
  Handlebar Installation 14-10

Exploded View



Exploded View

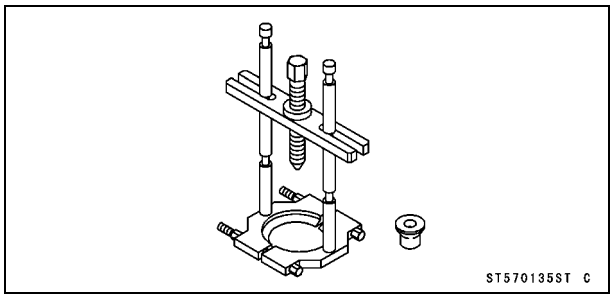
No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Handlebar Holder Bolts	25	2.5	18.0	S
2	Steering Stem Head Nut	98	10	72	
3	Steering Stem Locknut	4.9	0.5	43 in·lb	T
4	Front Fork Clamp Bolts (Upper)	20	2.0	14.5	AL, L
5	Front Fork Clamp Bolts (Lower)	20	2.0	14.5	AL

6. Pad Cover with Pad
7. Handlebar Holder (Upper)
8. Handlebar
9. Handlebar Holder (Lower)
10. Steering Stem Head Bracket
11. Upper Tapered Roller Bearing
12. Head Pipe
13. Lower Tapered Roller Bearing
14. Steering Stem

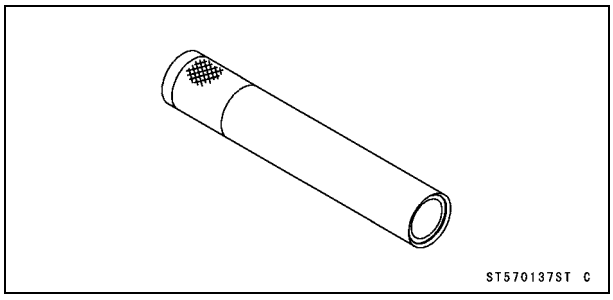
AD: Apply adhesive cement.
AL: Tighten the two clamp bolts alternately two times to ensure even tightening torque.
G: Apply grease.
L: Apply a non-permanent locking agent.
O: Apply 2 Stroke Oil.
S: Follow the specific tightening sequence.
T: First, tighten the stem locknut with 39 N·m (4.0 kgf·m, 29 ft·lb) of torque, then loosen it and retighten it with 4.9 N·m (0.5 kgf·m, 43 in·lb) of torque.

Special Tools

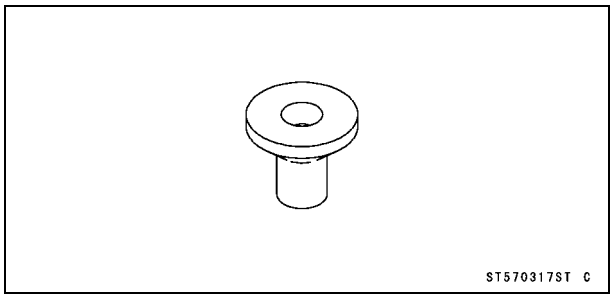
Bearing Puller:
57001-135



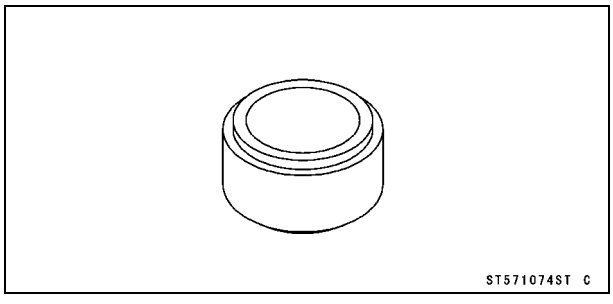
Steering Stem Bearing Driver:
57001-137



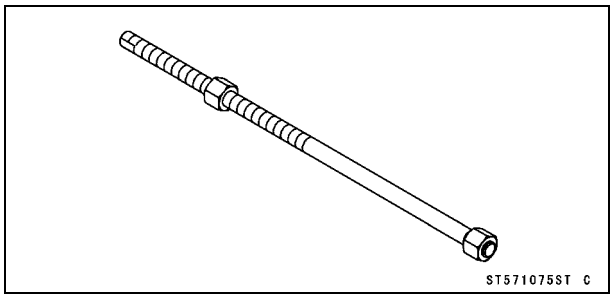
Bearing Puller Adapter:
57001-317



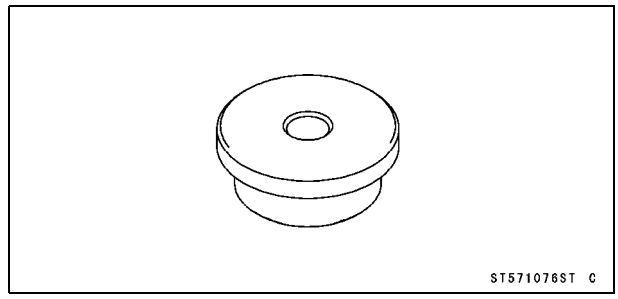
Steering Stem Bearing Driver Adapter, ϕ34.5:
57001-1074



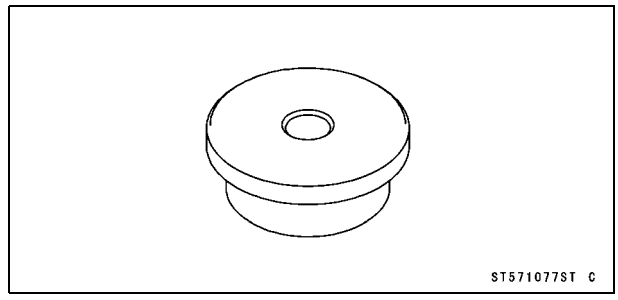
Head Pipe Outer Race Press Shaft:
57001-1075



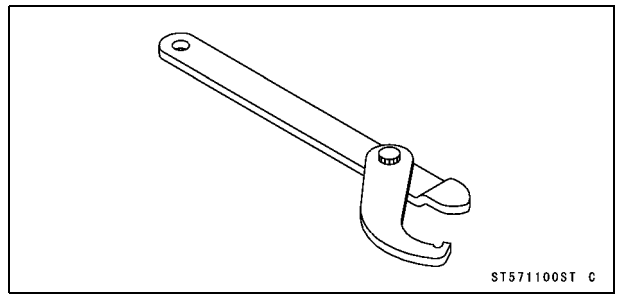
Head Pipe Outer Race Driver, ϕ51.5:
57001-1076



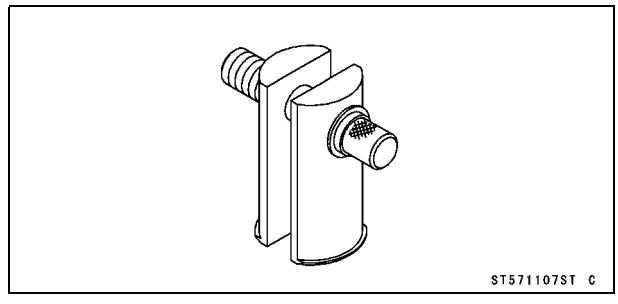
Head Pipe Outer Race Driver, ϕ54.5:
57001-1077



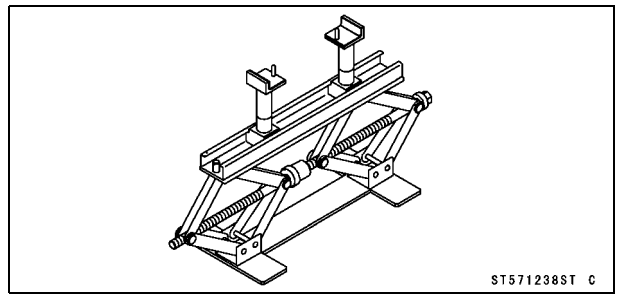
Steering Stem Nut Wrench:
57001-1100



Head Pipe Outer Race Remover ID > 37 mm:
57001-1107

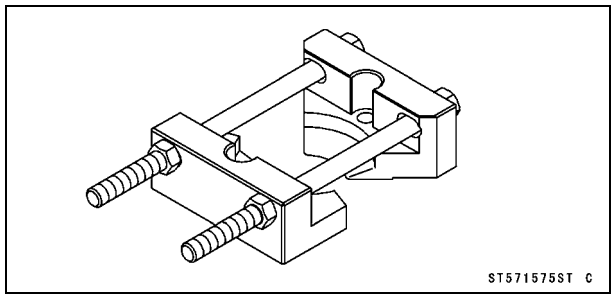


Jack:
57001-1238



Special Tools

Bearing Puller:
57001-1575



Steering

Steering Inspection

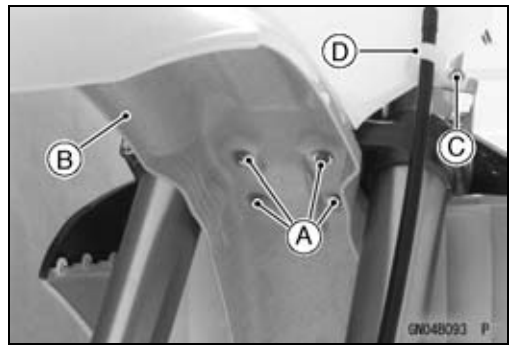
- Refer to the Steering Inspection in the Periodic Maintenance chapter.

Steering Adjustment

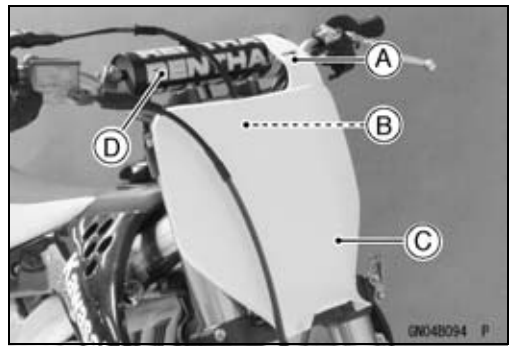
- Refer to the Steering Adjustment in the Periodic Maintenance chapter.

Steering Stem, Stem Bearing Removal

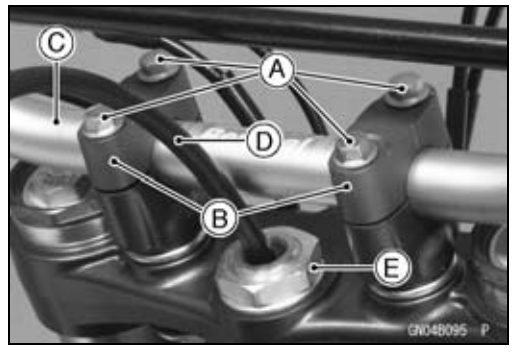
- Remove:
  Front Wheel (see Front Wheel Removal in the Wheels/Tires chapter)
  Front Fender Bolts [A]
  Front Fender [B]
  Brake Hose Clamp Bolt [C]
  Brake Hose Clamp [D]



- Remove:
  Band [A]
  Number Plate Bolt [B]
  Number Plate [C]
  Pad Cover and Pad [D]



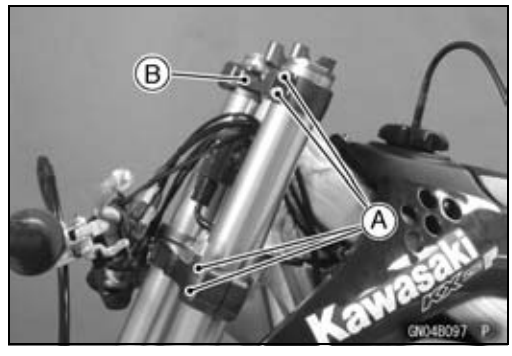
- Remove:
  Handlebar Holder Bolts [A]
  Handlebar Holder [B]
  Handlebar [C] (Hanging)
- Pull out breather hose [D].
- Remove the steering stem head nut [E] and washer.



- Remove:
  Front Fork (see Front Fork Removal in the Suspension chapter)

○Loosen the fork clamp bolts [A].

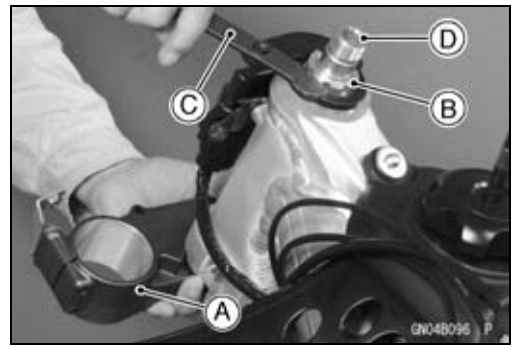
- Remove the steering stem head [B].



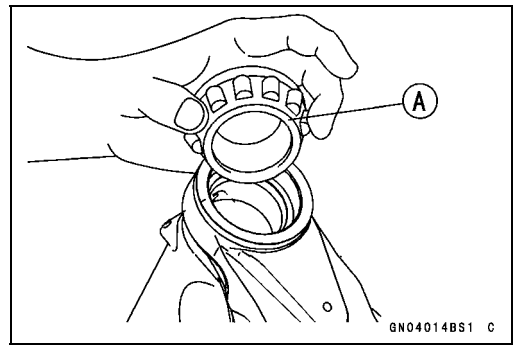
Steering

● Pushing up on the stem base [A], and remove the steering stem nut [B], with the steering stem nut wrench [C], then remove the steering stem [D] and stem base.

Special Tool - Steering Stem Nut Wrench: 57001-1100



● Take off the upper stem bearing inner race (tapered roller bearing) [A].



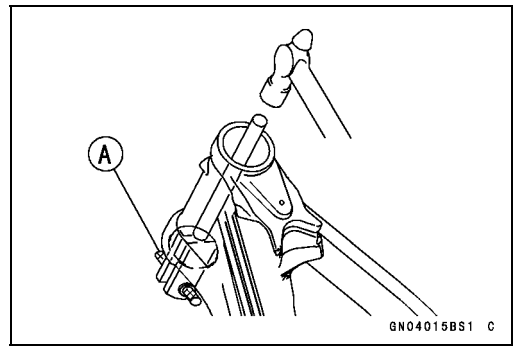
● Drive out the bearing outer races from the head pipe.

○Remove the outer races pressed into the head pipe, using the head pipe outer race remover [A], and hammer the head pipe outer race remover to drive it out.

Special Tool - Head Pipe Outer Race Remover ID > 37 mm: 57001-1107

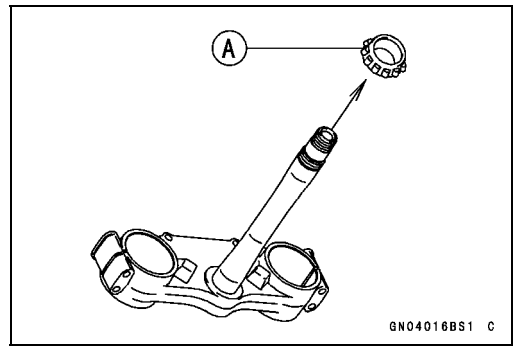
NOTE

○*If either steering stem bearing is damaged, it is recommended that both the upper and lower bearing (including outer races) should be replaced with new ones.*



● Remove the lower stem bearing inner rase (tapered roller bearing) [A] with its grease seal from the stem using bearing puller.

Special Tools - Bearing Puller: 57001-1575
Bearing Puller: 57001-135
Bearing Puller Adapter: 57001-317

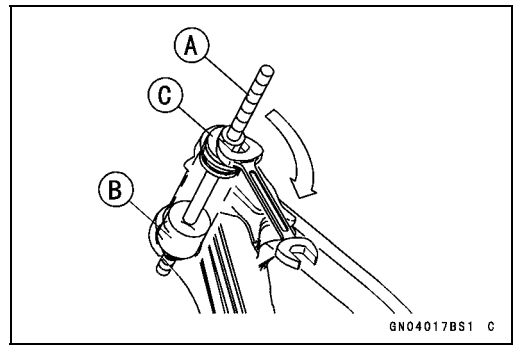


Steering Stem, Stem Bearing Installation

● Replace the bearing outer race with new ones.

○Apply grease to the outer races, and drive them into the head pipe at the same time using the head pipe outer race press shaft [A] and the drivers.

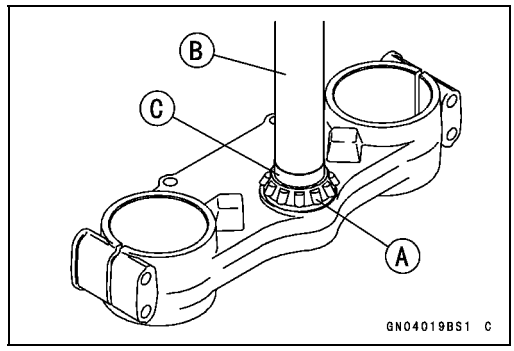
Special Tools - Head Pipe Outer Race Press Shaft: 57001-1075
Head Pipe Outer Race Driver, ϕ51.5: 57001-1076 [B]
Head Pipe Outer Race Driver, ϕ54.5: 57001-1077 [C]



Steering

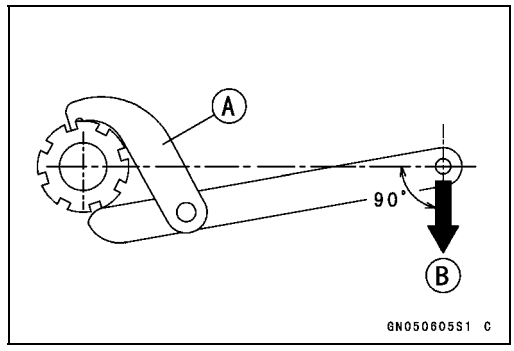
● Replace the lower inner races with new ones.
○Apply grease to the lower tapered roller bearing [A], and drive it onto the stem using the steering stem bearing driver [B] and adapter [C].

Special Tools - Steering Stem Bearing Driver: 57001-137
Steering Stem Bearing Driver Adapter, ϕ34.5: 57001-1074



● Apply grease to the upper inner race, and install it in the head pipe.
● Install the stem through the head pipe and upper bearing, install the stem cap and hand-tighten the locknut while pushing up on the stem base.
● Install the stem head and washer, and tighten the stem head nut lightly.
● Settle the bearing in place as follows;
○Tighten the stem locknut to 39 N·m (4.0 kgf·m, 29 ft·lb) of torque. (To tighten the steering stem locknut to the specified torque, hook the wrench [A] on the stem locknut, and pull the wrench at the hole by 22.2 kg force [B] in the direction shown.)

Special Tool - Steering Stem Nut Wrench: 57001-1100



○Check that there is no play and the steering stem turns smoothly without rattles. If not, the steering stem bearings may be damaged.
○Again back out the stem locknut a fraction of a turn until it turns lightly.
○Turn the stem locknut lightly clockwise until it just becomes hard to turn. Do not overtighten, or the steering will be too tight.

Torque - Steering Stem Locknut: 4.9 N·m (0.5 kgf·m, 43 in·lb)

● Install the front fork (see Front Fork Installation in the Suspension chapter).

NOTE

○*Tighten the fork upper clamp bolts first, next the stem head nut, last the fork lower clamp bolt.*

Torque - Steering Stem Head Nut: 98 N·m (10 kgf·m, 72 ft·lb)
Front Fork Clamp Bolts:
Upper: 20 N·m (2.0 kgf·m, 14.5 ft·lb)
Lower: 20 N·m (2.0 kgf·m, 14.5 ft·lb)

NOTE

○*Tighten the two clamp bolts alternately two times to ensure even tightening torque.*

Steering

- Install the parts removed.

⚠ WARNING

Do not impede the handlebar turning by routing the cables, wires and hoses improperly (see Cable, Wire, and Hose Routing in the Appendix chapter).

- Check and Adjust:
  Steering
  Front Brake
  Clutch Cable
  Throttle Cable

Stem Bearing Lubrication

- Refer to the Stem Bearing Lubrication in the Periodic Maintenance chapter.

Stem Bearing Wear, Damage Inspection

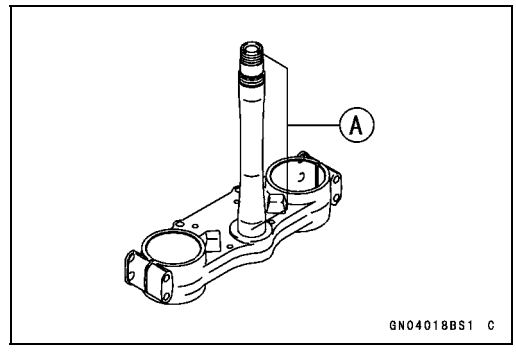
- Using a high flash-point solvent, wash the upper and lower tapered rollers in the cages, and wipe the upper and lower outer races, which are press-fitted into the frame head pipe, clean off grease and dirt.
- Visually check the outer rase and the rollers.

★Replace the bearing assembly if it show damage.

Stem Warp Inspection

- Whenever the steering stem is removed, or if the steering cannot be adjusted for smooth action, check the steering stem for straightness.

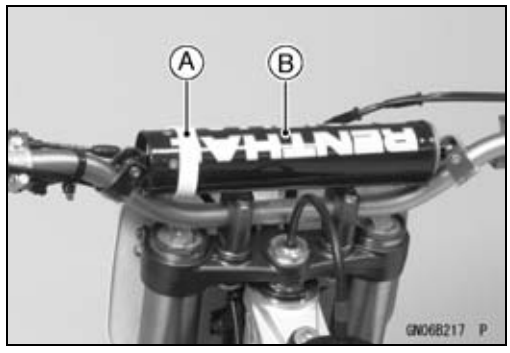
★If the steering stem shaft is bent [A], replace the steering stem.



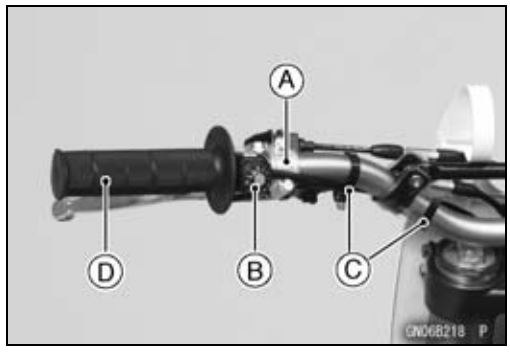
Handlebar

Handlebar Removal

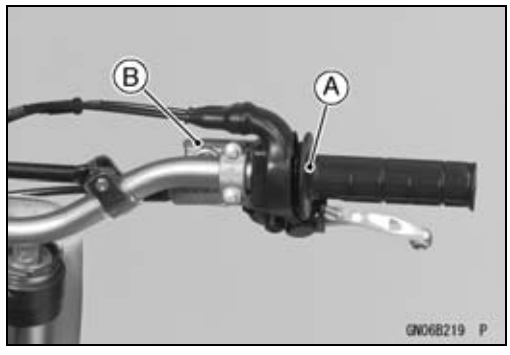
- Remove:
  Band [A]
  Pad Cover and Pad [B]



- Remove:
  Clutch Lever Holder Assembly [A]
  Engine Stop Switch [B]
  Bands [C]
  Left Handlebar Grip [D]

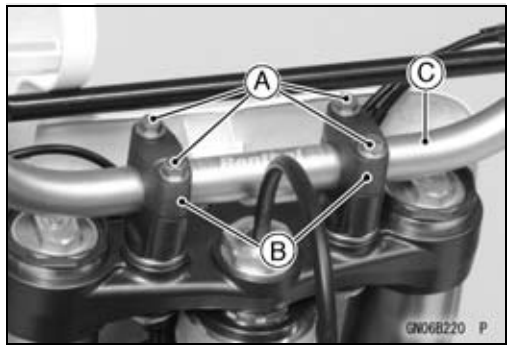


- Remove:
  Throttle Grip Assy [A] (see Throttle Cable Replacement in the Fuel System chapter)
  Front Brake Master Cylinder [B] (see Front Master Cylinder Removal in the Brakes chapter)



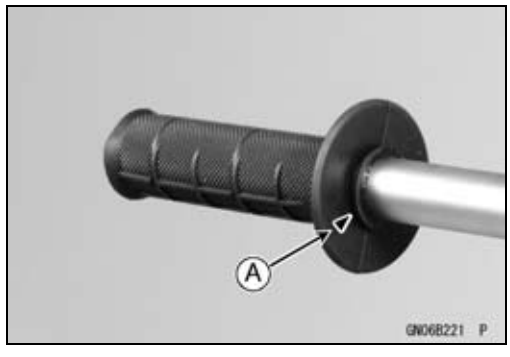
- Remove:
  Handlebar Holder Bolts [A]
  Handlebar Holder [B]
  Handlebar [C]
- Check the handlebar for bends or cracks.

★If the handlebar was bended or cracked, replace it.



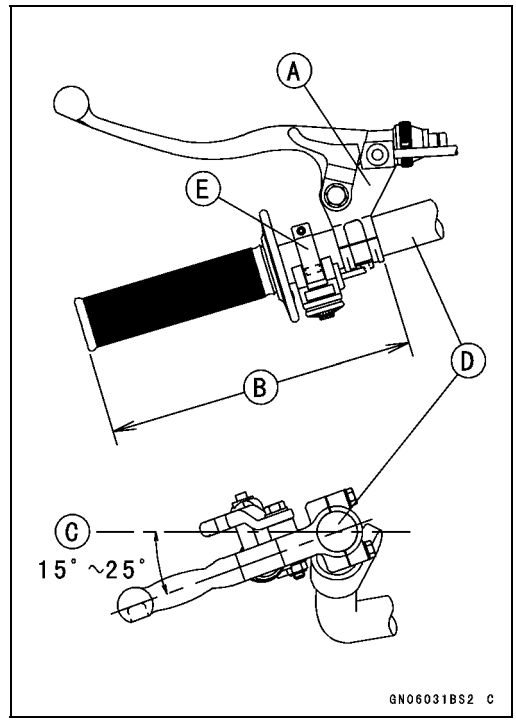
Handlebar Installation

- Apply adhesive cement to the inside of the left handlebar grip.
- The left handlebar grip must be installed with the arrow mark [A] forward.

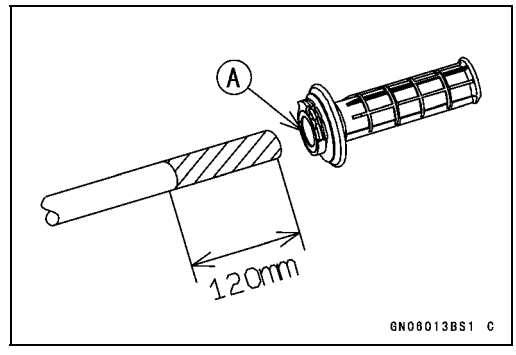


Handlebar

- Install the clutch lever holder assembly [A] position as shown in the figure.
  [B] 170 mm
  [C] Horizontal Line of Frame
  [D] Handlebar
- Install the engine stop button [E].

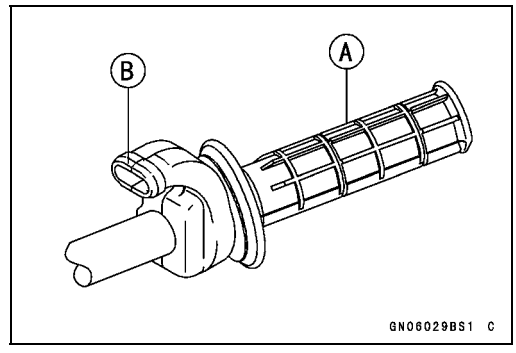


- Apply grease to the throttle cable upper end and clutch cable upper end.
- Apply a 2 stroke oil to the throttle grip inner wall [A].



- Install the throttle grip assy so that the grip [A] is in as far as it will go.

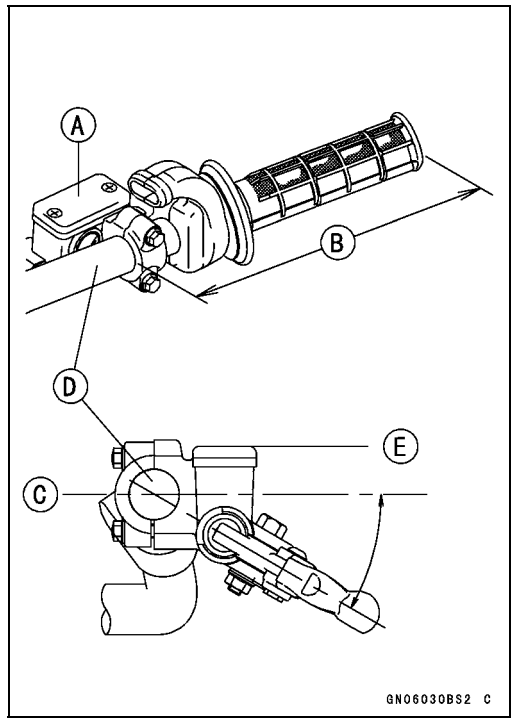
○Position the throttle grip assy so that the hollow end side portion [B] of the throttle case is above on the handlebar.



Handlebar

○Install the master cylinder [A] position as shown in the figure.
[B] 185 mm (7.28 in.)
[C] Horizontal Line of Frame
[D] Handlebar
[E] Horizontal Line of Cap Upper Surface

Torque - Front Master Cylinder Clamp Bolts: 8.8 N·m (0.9 kgf·m, 78 in·lb)

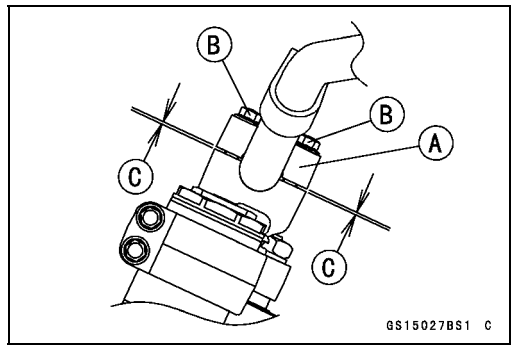


● Install the holders clamps [A].
● Tighten the handlebar holder bolts [B].
○If the handlebar holder is correctly installed, there will be same a gap [C] at the front side and rear side.

NOTE

○*Tighten the two holder bolts alternately two times to ensure even tightening torque.*

Torque - Handlebar Holder Bolts: 25 N·m (2.5 kgf·m, 18 ft·lb)

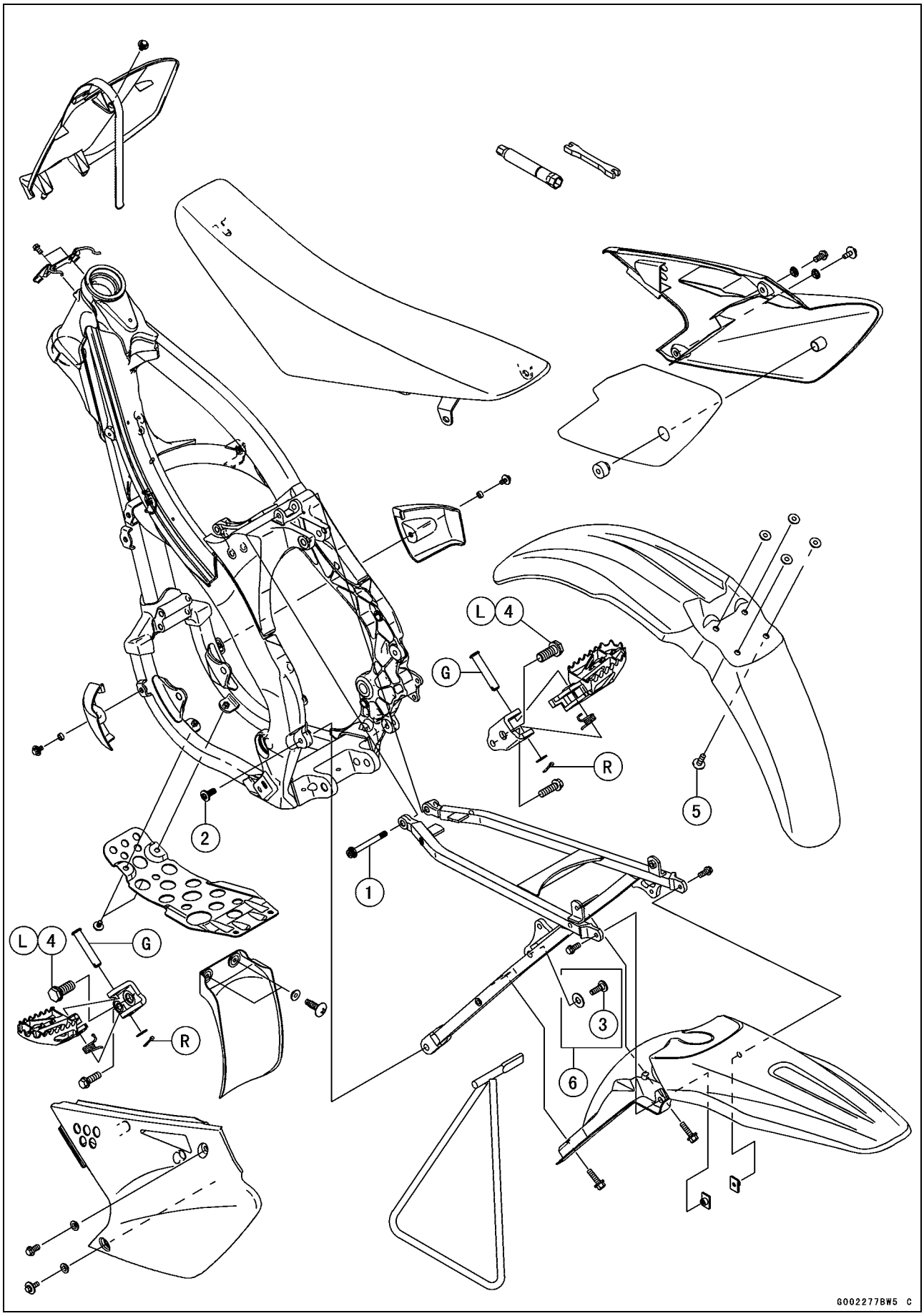


Frame

Table of Contents

Exploded View 15-2
Frame 15-4
  Frame Inspection 15-4
  Rear Frame Removal 15-4
  Rear Frame Installation 15-4
  Engine Guard Installation 15-5
Seat 15-6
  Seat Removal 15-6
  Seat Installation 15-6
Side Cover 15-7
  Side Cover Removal 15-7
  Side Cover Installation 15-7
Fender 15-8
  Front Fender Removal 15-8
  Rear Fender Removal 15-8
  Rear Flap Removal 15-8

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Rear Frame Mounting Bolt (Upper)	34	3.5	25	
2	Rear Frame Mounting Bolts (Lower) L = 20	34	3.5	25	
3	Rear Frame Mounting Bolts (Lower) L = 25	34	3.5	25	
4	Footpeg Bracket Bolts (Upper)	54	5.5	40	L

5. Front Fender Bolts
6. KX250T7F ~

G: Apply grease.
L: Apply a non-permanent locking agent.
R: Replacement Parts

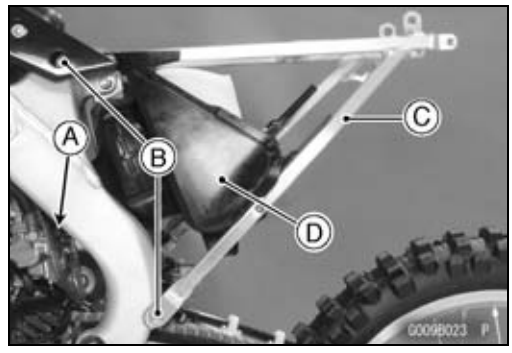
Frame

Frame Inspection

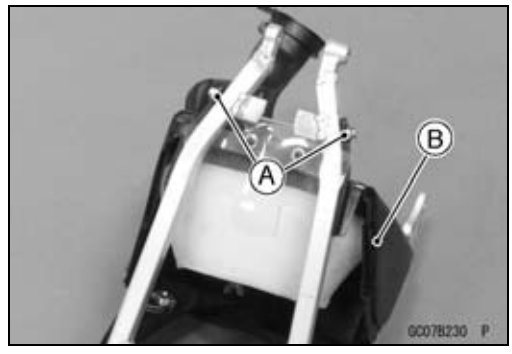
- Refer to the Frame Inspection in the Periodic Maintenance chapter.

Rear Frame Removal

- Remove:
  Seat (see Seat Removal)
  Right & Left Side Cover (see Side Cover Removal)
  Muffler Body (see Muffler Removal in the Engine Top End chapter)
  Rear Fender (see Rear Fender Removal)
  Rear Flap (see Rear Flap Removal)
- Loosen the air cleaner duct clamp screw [A].
- Unscrew the rear frame mounting bolts [B]. (KX250T6F)
- Remove the rear frame mounting bolts [B], and the washer at right lower frame. (KX250T7F ~)
- Remove the rear frame [C] with air cleaner housing [D].

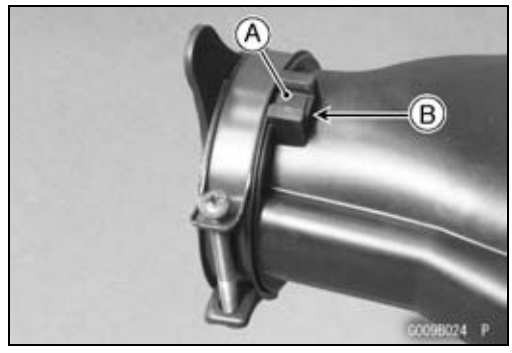


- Remove:
  Bolts [A]
  Air Cleaner Housing [B]



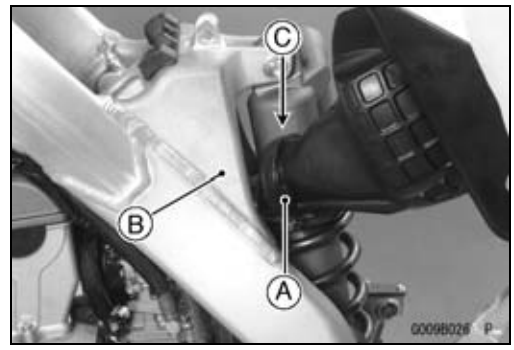
Rear Frame Installation

- Install the air cleaner housing.
- Fit the claw [A] of the clamp onto the groove [B] of the cleaner duct.

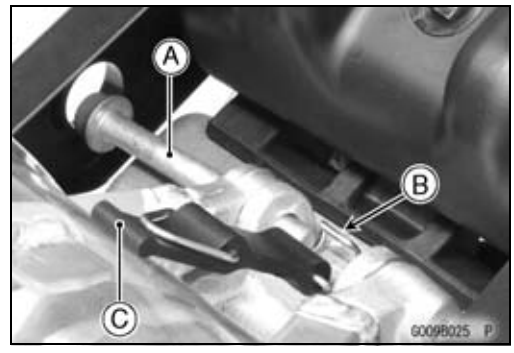


Frame

- Insert the duct end [A] slantly between the frame [B] and upper portion [C] of the shock absorber.



- Install the rear frame upper mounting bolt [A] through the hook [B] of the band [C].



- Tighten the rear frame mounting bolts.

Torque - Rear Frame Mounting Bolts: 34 N·m (3.5 kgf·m, 25 ft·lb)

KX250T6F

Rear Frame Mounting Bolts (Lower) L = 20 mm

KX250T7F ~

Left Rear Frame Mounting Bolts (Lower) L = 20 mm

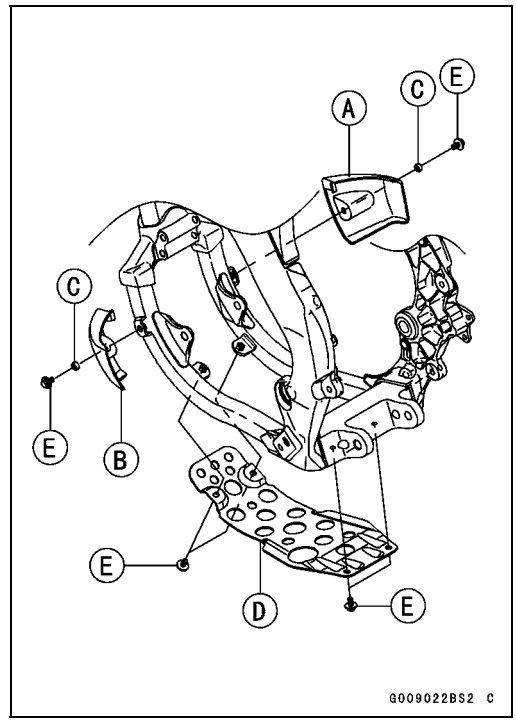
Right Rear Frame Mounting Bolts (Lower) L = 25 mm and Washer

- Install the removal parts.

Engine Guard Installation

- Install the engine guard as shown.

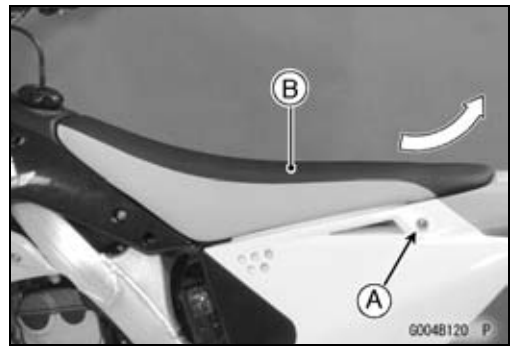
Right Engine Guard [A]
Left Engine Guard [B]
Collars [C]
Engine Guard [D]
Bolts [E]



Seat

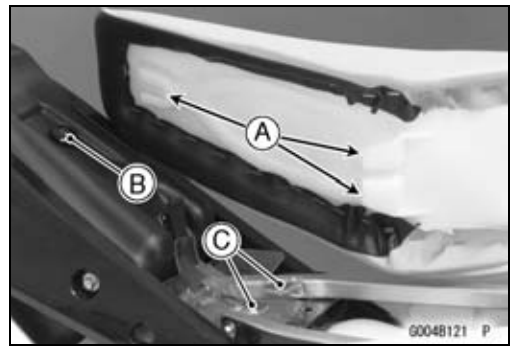
Seat Removal

- Unscrew the bolts [A].
- Pull the seat [B] out from the back.



Seat Installation

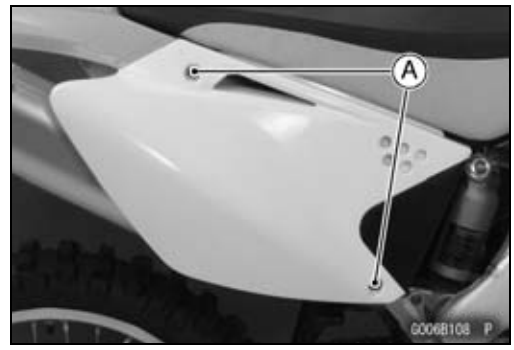
- Fit the hooks [A] of the seat under the flange collar [B] and brackets [C].



Side Cover

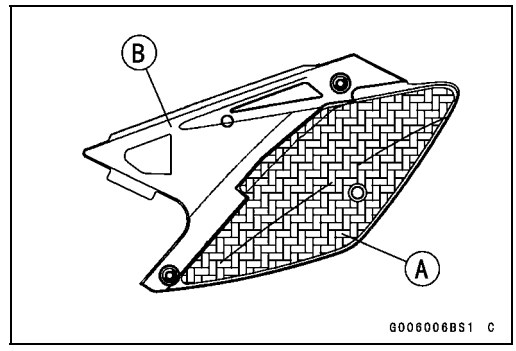
Side Cover Removal

- Unscrew the bolts [A] and remove the side cover.

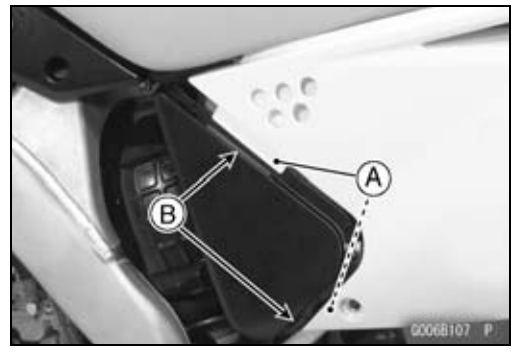


Side Cover Installation

- Stick the pads [A] on the inside of the right side cover [B].
- Install the damper.



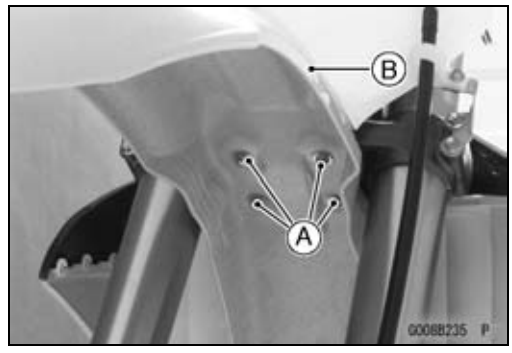
- Insert the tabs [A] of the cover into the slots [B] of the air cleaner housing.



Fender

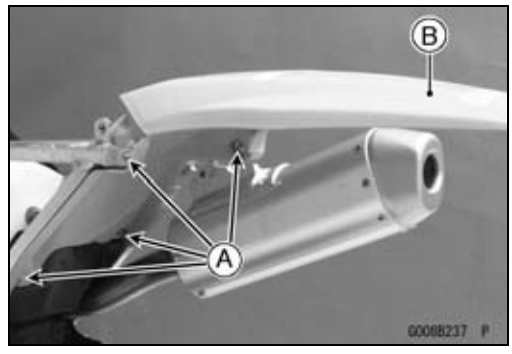
Front Fender Removal

- Unscrew the bolts [A] and remove the front fender [B].



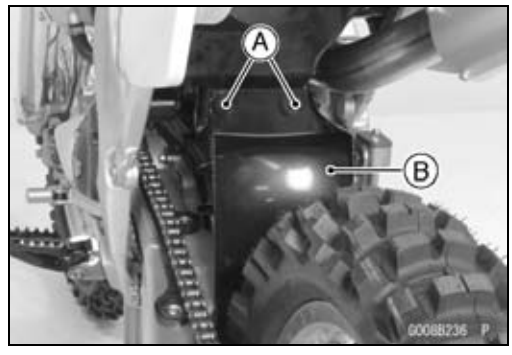
Rear Fender Removal

- Remove:
  Seat
- Unscrew the bolts [A] and remove the rear fender [B].



Rear Flap Removal

- Unscrew the screws [A] and remove the rear flap [B].

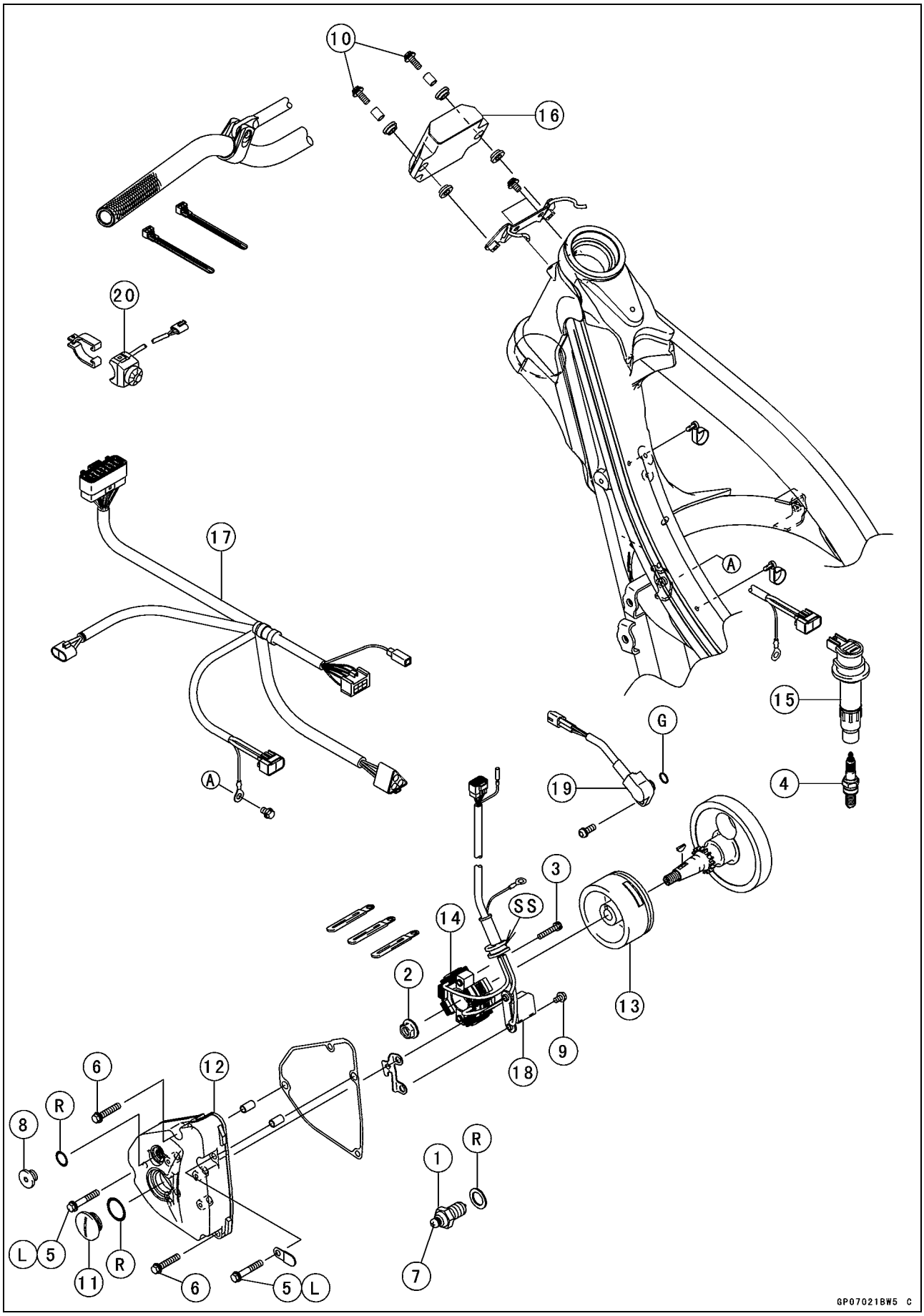


Electrical System

Table of Contents

Exploded View 16-2
Specifications 16-4
Special Tools & Sealant 16-5
Wiring Diagram 16-6
Precautions 16-7
  Safety Instructions 16-7
Electrical Wiring 16-8
  Wiring Inspection 16-8
Flywheel Magneto 16-9
  Magneto Cover Removal 16-9
  Magneto Cover Installation 16-9
  Flywheel Magneto Removal 16-9
  Flywheel Magneto Installation 16-10
  Stator Removal 16-11
  Stator Installation 16-11
  Flywheel Magneto Inspection 16-11
Ignition Timing 16-13
  Ignition Timing Inspection 16-13
Ignition System 16-14
  Safety Instructions 16-14
  Stick Coil Removal 16-14
  Stick Coil Installation 16-14
  Stick Coil Inspection 16-14
  Spark Plug Cleaning and Inspection 16-14
  Spark Plug Gap Inspection 16-15
  C.D.I. Unit Removal 16-15
  C.D.I. Unit Inspection 16-15
  Crankshaft Sensor Inspection 16-20
Throttle Sensor 16-21
  Throttle Sensor Inspection 16-21
  Throttle Sensor Position Adjustment 16-22
Neutral Switch 16-23
  Neutral Switch Inspection 16-23

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Neutral Switch	12	1.2	104 in·lb	
2	Flywheel Nut	49	5.0	36	
3	Stator Bolts	7.0	0.7	61 in·lb	
4	Spark Plug	13	1.3	113 in·lb	
5	Magneto Cover Bolts L35	9.8	1.0	87 in·lb	L
6	Magneto Cover Bolts L30	9.8	1.0	87 in·lb	
7	Neutral Switch Lead Terminal Screw	1.3	0.13	12 in·lb	
8	Timing Inspection Plug	4.0	0.4	35 in·lb	
9	Crankshaft Sensor Bolts	7.0	0.7	61 in·lb	
10	C.D.I. Unit Bolts	9.8	1.0	87 in·lb	
11	Flywheel Plug	5.0	0.5	43 in·lb	

12. Magneto Cover
13. Flywheel Magneto
14. Stator
15. Stick Coil
16. C.D.I. Unit
17. Main Harness
18. Crankshaft Sensor
19. Throttle Sensor
20. Engine Stop Switch

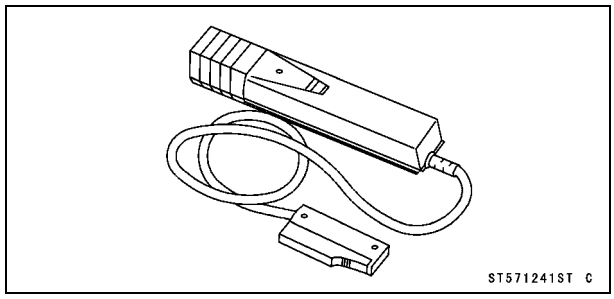
G: Apply grease.
L: Apply a non-permanent locking agent.
R: Replacement Parts
SS: Apply silicone sealant.

Specifications

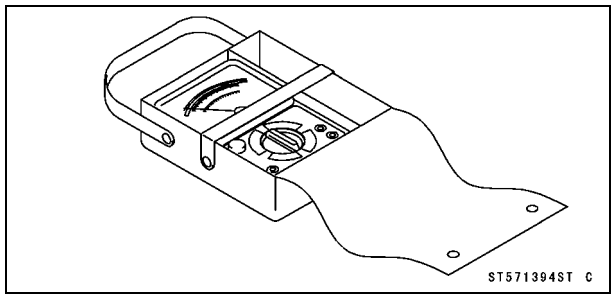
Item	Standard
Magneto	
Crankshaft Sensor Resistance	80 ~ 120 Ω
Magneto Output Voltage	in the text
Stator Coil Resistance	in the text
Ignition System	
Ignition Timing	8° BTDC @2 000 r/min (rpm)
Stick Coil:	
Primary Winding Resistance	0.077 ~ 0.104 Ω (at 20°C)
Secondary Winding Resistance	4.56 ~ 6.84 kΩ (at 20°C)
Spark Plug:	
Type	NGK CR8E
Gap	0.7 ~ 0.8 mm (0.026 ~ 0.031 in.)
C.D.I. Unit	in the text
Throttle Sensor	
Input Voltage	around 5 V
Output Voltage:	
(when the Throttle Valve Completely Closed).	0.58 ~ 0.78 V
(when the Throttle Fully Opened).	3.5 ~ 3.7 V

Special Tools & Sealant

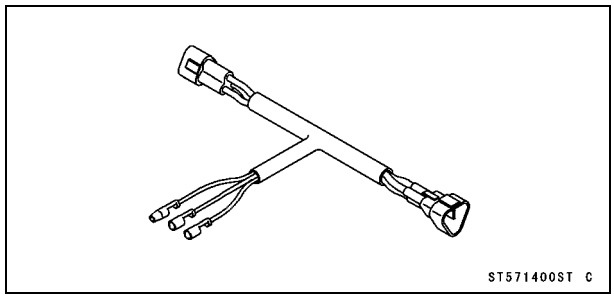
Timing Light:
57001-1241



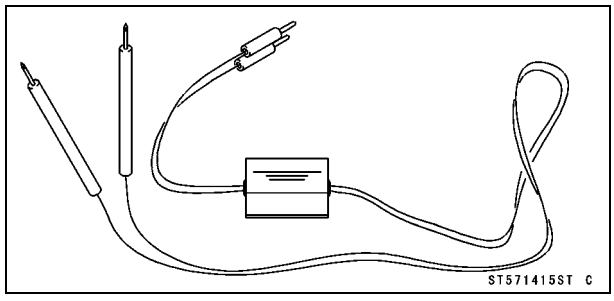
Hand Tester:
57001-1394



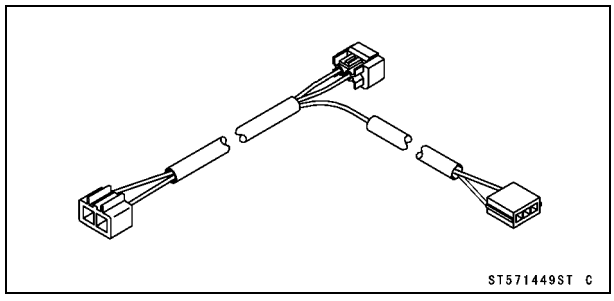
Throttle Sensor Setting Adapter #1:
57001-1400



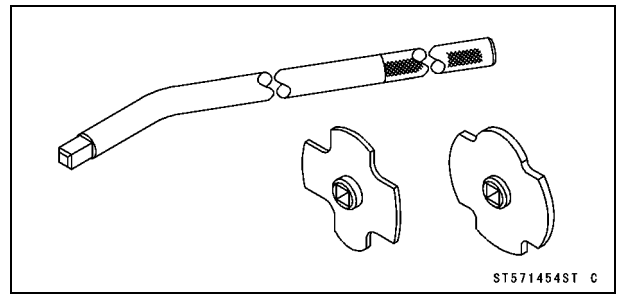
Peak Voltage Adapter:
57001-1415



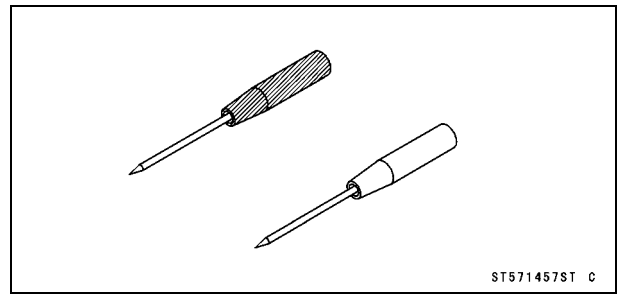
Lead Wire - Peak Voltage Adapter:
57001-1449



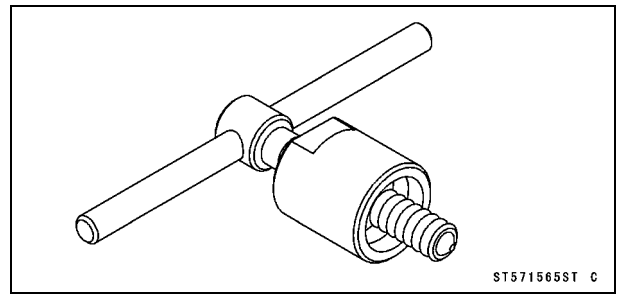
Filler Cap Driver:
57001-1454



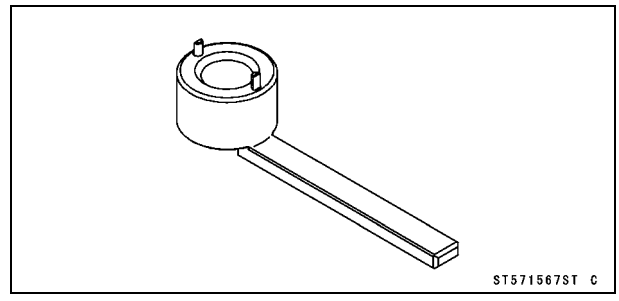
Needle Adapter Set:
57001-1457



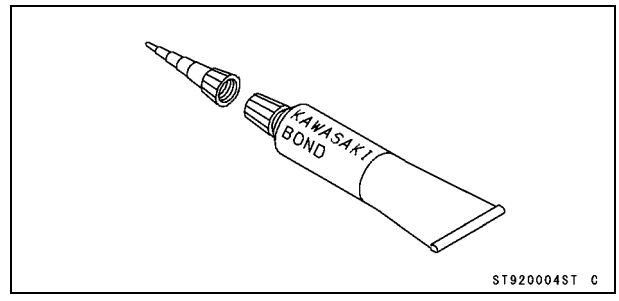
Rotor Puller:
57001-1565



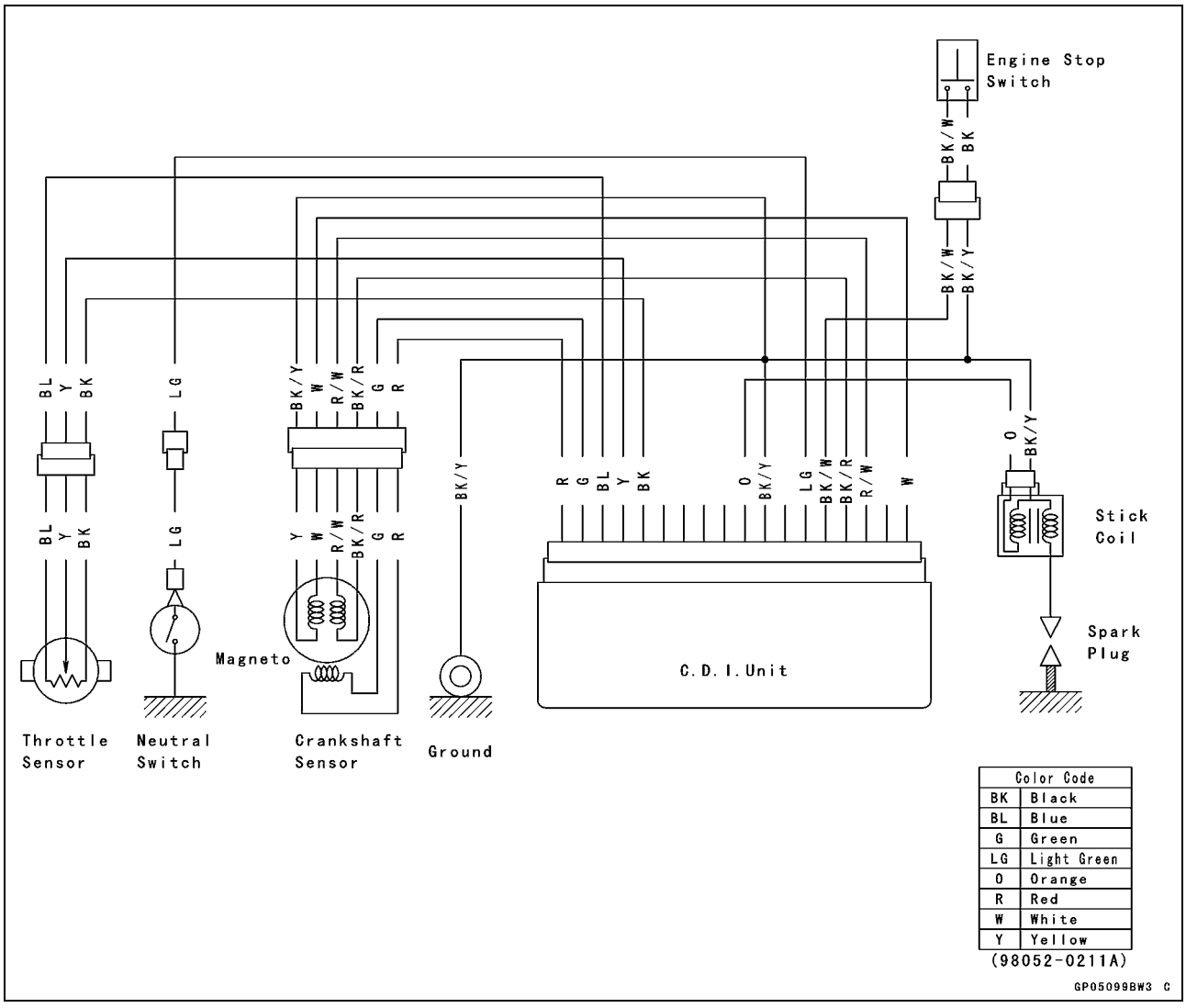
Rotor Holder:
57001-1567



Kawasaki Bond (Silicone Sealant):
92104-0004



Wiring Diagram



Precautions

There are numbers of important precautions that are musts when servicing electrical systems. Learn and observe all the rules below.

- The electrical parts should never be struck sharply, as with a hammer, or allowed to fall on a hard surface. Such a shock to the parts can damage them.
- Troubles may involve one or in some cases all items. Never replace a defective part without determining what CAUSED the failure. If the failure was caused by some other item or items, they too must be repaired or replaced, or the new replacement will soon fail again.
- Make sure all connectors in the circuit are clean and tight, and examine leads for signs of burning, fraying, etc. Poor leads and bad connections will affect electrical system operation.
- Measure coil and winding resistance when the part is cold (at room temperature).

Safety Instructions

⚠ WARNING

The ignition system produces extremely high voltage. Do not touch the stick coil while the engine is running, or you could receive a severe electrical shock.

Electrical Wiring

Wiring Inspection

- Visually inspect the wiring for signs of burning, fraying, etc.

★If any wiring is poor, replace the damaged wiring.

- Pull each connector [A] apart and inspect it for corrosion, dirt, and damage.

★If the connector is corroded or dirty, clean it carefully. If it is damaged, replace it.

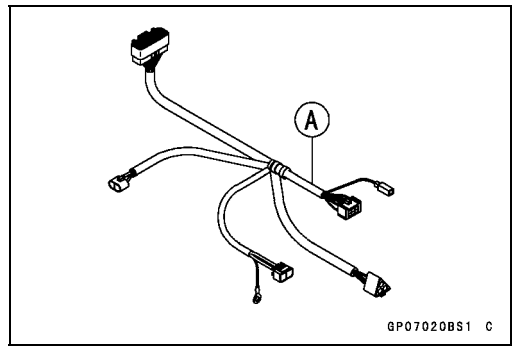
- Check the wiring for continuity.

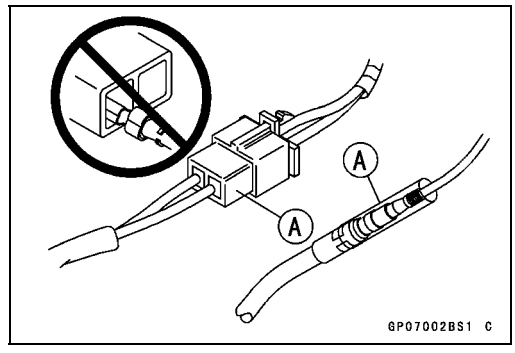
○Use the wiring diagram to find the ends of the lead which is suspected of being a problem.

○Connect an ohmmeter between the ends of the leads.

○Set the meter to the x 1 Ω range, and read the meter.

★If the meter does not read 0 Ω, the lead is defective. Replace the lead or the wiring harness if necessary.



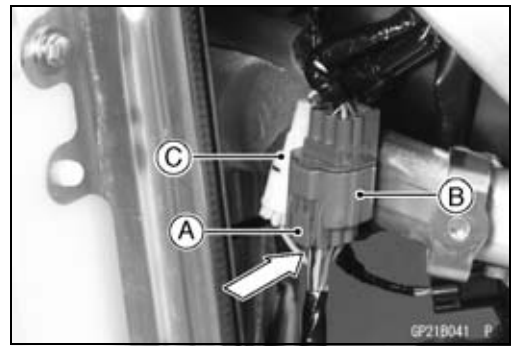


Flywheel Magneto

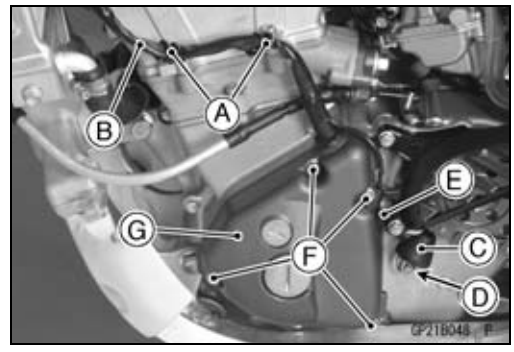
Magneto Cover Removal

- Drain the engine oil from the crank room oil sump (see Engine Oil Change in the Periodic Maintenance chapter).
- Remove the left radiator shroud (see Radiator Removal in the Cooling System chapter).

- Push down the stopper [A].
- Remove the magneto lead connector [B].
- Disconnect the magneto lead connector with neutral switch lead connector [C] from the main harness.



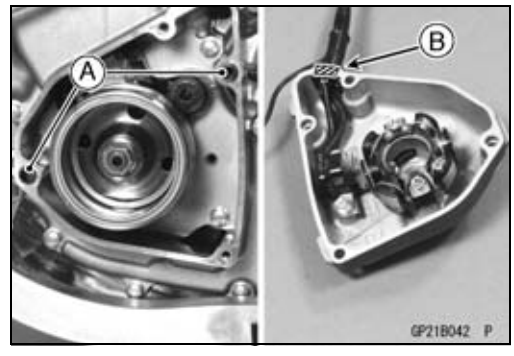
- Remove the shift pedal (see Engine Right Side chapter).
- Open the clamps [A] then free the magneto lead [B].
- Slide out the dust cover [C].
- Unscrew the screw [D] and remove the neutral switch lead [E].
- Remove:
  Magneto Cover Mounting Bolts [F].
  Magneto Cover [G]



Magneto Cover Installation

- Replace the gasket with a new one.
- Be sure to install the dowel pins [A].
- Apply silicone sealant to the area [B] to the magneto lead grommet.

Sealant - Kawasaki Bond (Silicone Sealant): 92104-0004

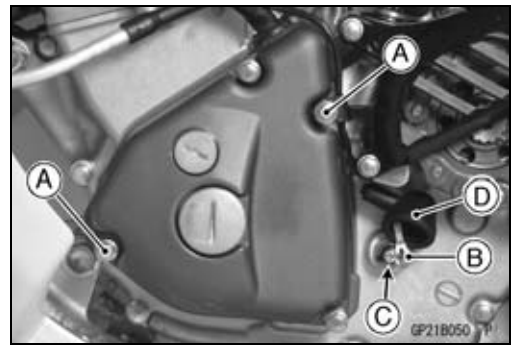


- Tighten the cover bolts.

○Apply a non-permanent locking agent to the cover bolts (L35)[A].

- Install the neutral switch lead [B].
- Tighten the neutral switch terminal screw [C].
- Install the dust cover [D].

Torque - Magneto Cover Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)
Neutral Switch Lead Terminal Screw: 1.3 N·m (0.13 kgf·m, 12 in·lb)



- Connect the lead connector.

Flywheel Magneto Removal

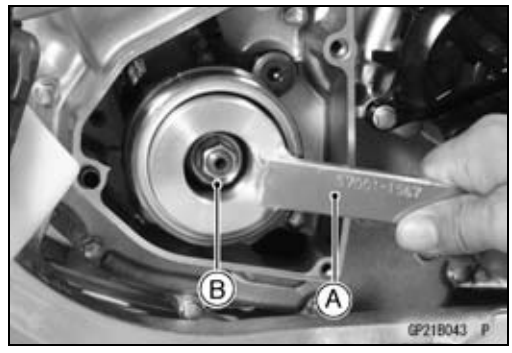
- Remove the magneto cover (see Magneto Cover Removal).

Flywheel Magneto

● Hold the flywheel steady, with the rotor holder [A], and remove the nut [B].

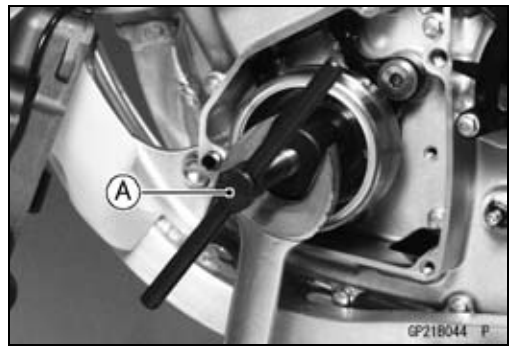
Special Tool - Rotor Holder: 57001-1567

● Remove the flywheel holder.



● Screw the rotor puller [A] into the flywheel.
● Remove the flywheel from the crankshaft by turning in the puller center bolt and tapping the head of the bolt lightly with a hammer, while holding the puller body steady. There is a woodruff key in the crankshaft tapered portion.

Special Tool - Rotor Puller: 57001-1565

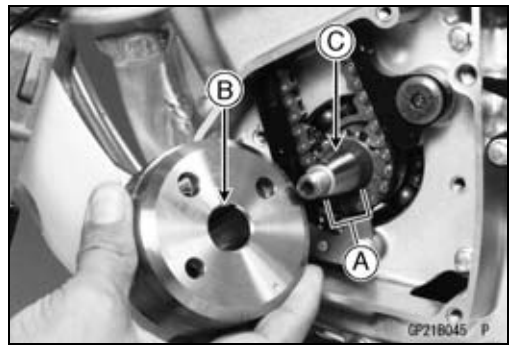


CAUTION

Never strike the grab bar or the flywheel itself. Striking the bar can bond it. If the flywheel is struck, the magnets may lose their magnetism.

Flywheel Magneto Installation

● Using a high flash-point solvent, clean off any oil or dirt that may be on the crankshaft taper [A] or in the hole [B] of the flywheel. Dry them with a clean cloth.
● Fit the woodruff key [C] securely in the slot in the crankshaft.



NOTE

○*Confirm the flywheel fit or not to the crankshaft before tightening it with specified torque.*

● Install the flywheel and tighten it with 45 N·m (4.5 kgf·m, 33 ft·lb) of torque.
● Remove the flywheel nut.
○Prepare the auxiliary bolt (M12 mm × P1.25 mm × L100 mm)
○Check the tightening torque with rotor puller and auxiliary bolt [A].

Special Tool - Rotor Puller: 57001-1565

★If the flywheel is not pulled out with 20 N·m (2.0 kgf·m, 15 ft·lb) of drawing torque, it is installed correctly.
★If the flywheel is pulled out with under 20 N·m (2.0 kgf·m, 15 ft·lb) of drawing torque, clean off any oil dirt or flaw of the crankshaft and flywheel tapered portion, and dry them with a clean cloth. Then, confirm that it is not pulled out with above torque.

● Holding the flywheel steady, with the flywheel holder, and tighten the flywheel nut.

Special Tool - Rotor Holder: 57001-1567

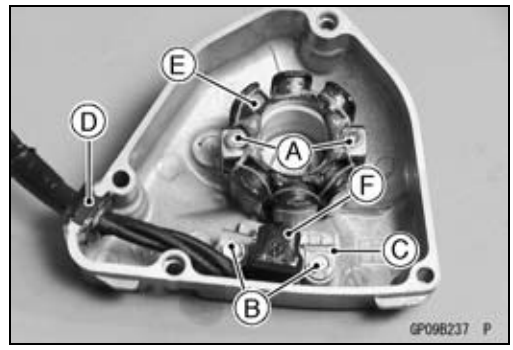
Torque - Flywheel Nut: 49 N·m (5.0 kgf·m, 36 ft·lb)

● Install the magneto cover (see Magneto Cover Installation)

Flywheel Magneto

Stator Removal

- Remove:
  Magneto Cover (see Magneto Cover Removal)
  Stator Bolts [A]
  Crankshaft Sensor Bolts [B]
  Wiring Holder [C]
  Wiring Grommet [D]
- Remove the stator [E] and crankshaft sensor [F] as a set.



Stator Installation

- Route the wires according to the Cable, Wiring, and Hose Routing section in the Appendix chapter.
- Install the stator and tighten it.

Torque - Stator Bolts: 7.0 N·m (0.7 kgf·m, 61 in·lb)

- Install the crankshaft sensor and wiring holder [A].

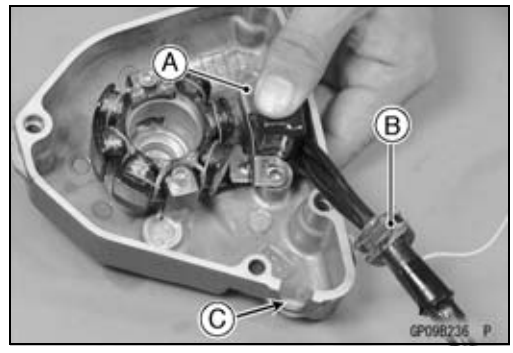
○Run the magneto leads under the holder and sensor.

Torque - Crankshaft Sensor Bolts: 7.0 N·m (0.7 kgf·m, 61 in·lb)

- Apply silicone sealant around the circumference of the wiring grommet.

Sealant - Kawasaki Bond (Silicone Sealant): 92104-0004

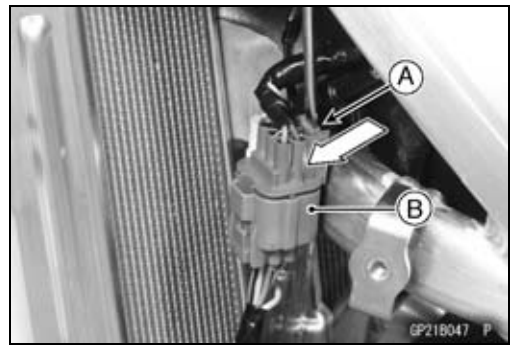
- Set the stator wiring grommet [B] securely in the notch [C].
- Install the magneto cover (see Magneto Cover Installation).



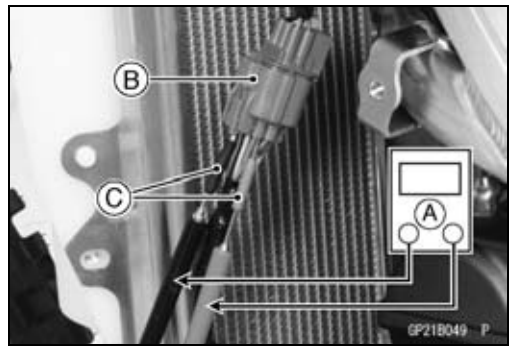
Flywheel Magneto Inspection

- There are three types of magneto problems: short, open (wire burned out), or loss in flywheel magnetism. A short or open in one of the coil leads will result in either a low output, or no output at all. A loss in flywheel magnetism, which may be caused by dropping or hitting the flywheel by leaving it near an electromagnetic field, or just by aging, will result in low output.
- Remove the left radiator shroud (see Radiator Removal in the Cooling System chapter).
- Check the magneto output voltage, do the following procedures.

○Pull the stopper [A] outside and remove the magneto lead connector [B].



Flywheel Magneto



○Connect the hand tester [A] to the connector [B] as shown in the table 1, using the needle adapter set [C].
○Start the engine.
○Run it at the rpm given in the table 1.
○Note the voltage readings (total 2 measurements).

Special Tool - Needle Adapter Set: 57001-1457

Table 1 Magneto Output Voltage

Tester Range	Connections		Reading @4 000 rpm
	Tester (+) to	Tester (–) to	
250 V AC	Black/Red lead	Red/White lead	40 V or more
50 V AC	White lead	Yellow lead	15 V or more

★If the output voltage shows the value in the table, the magneto operates properly.
★If the output voltage shows a much lower reading than that given in the table indicates that the magneto is defective.
● To check the stator coil resistance as follows.
○Stop the engine.
○Disconnect the magneto lead connector.
○Connect the hand tester as shown in the table 2.
○Note the readings (total 2 measurement).

Table 2 Stator Coil Resistance

Tester Range	Connections		Reading
	Tester (+) to	Tester (–) to	
× 1 Ω	Black/Red lead	Red/White lead	27.2 ~ 40.8 Ω
	White lead	Yellow lead	1.76 ~ 2.64 Ω

★If there is more resistance than shown in the table, or no hand tester reading (infinity) the stator has an open lead and must be replaced. Much less than this resistance means the stator is shorted, and must be replaced.
● Using the highest resistance range of the hand tester, measure the resistance between each leads and chassis ground.
★Any hand tester reading less than infinity (∞) indicates a short, necessitating stator replacement.
★If the stator coils have normal resistance, but the voltage check showed the magneto to be defective; then the flywheel magnets have probably weakened, and the flywheel must be replaced.

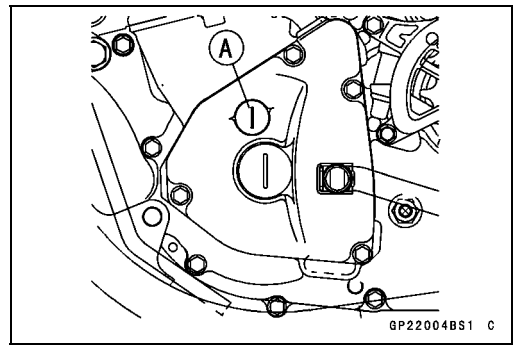
Special Tool - Hand Tester: 57001-1394

Ignition Timing

Ignition Timing Inspection

● Remove the timing inspection plug [A].

Special Tool - Filler Cap Driver: 57001-1454

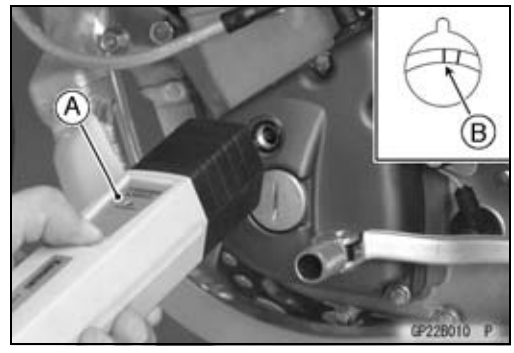


● Attach the timing light [A] to the ignition coil lead in the manner prescribed by the manufacturer.

Special Tool - Timing Light: 57001-1241

● Start the engine and aim the timing light at the ignition timing mark [B] on the flywheel.

● Run the engine at the speeds specified and note the alignment of the ignition timing marks.



○Check the engine speed, using the engine revolution tester [A] for high accuracy.

Ignition Timing

Engine speed [r/min (rpm)]	Hole groove aligns with:
2 000	Line mark on magneto rotor

★If the ignition timing is incorrect, check the crankshaft sensor (see Crankshaft Sensor Inspection).

★If the crankshaft sensor are normal, check the C.D.I. unit (see C.D.I. Unit Inspection).

● Install the timing inspection plug.

Torque - Timing Inspection Plug: 4.0 N·m (0.4 kgf·m, 35 in·lb)

Ignition System

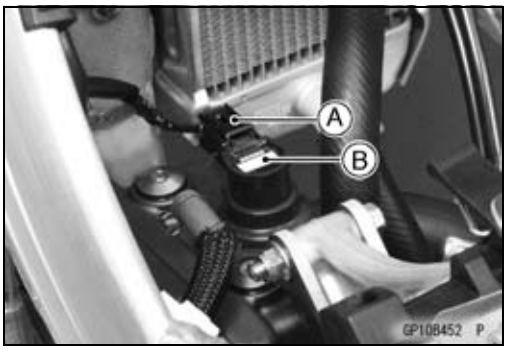
Safety Instructions

⚠ WARNING

The ignition system produces extremely high voltage. Do not touch the stick coil while the engine is running, or you could receive a severe electrical shock.

Stick Coil Removal

- Remove:
  Seat (see Seat Removal in the Frame chapter)
  Fuel Tank (see Fuel Tank Removal in the Fuel System chapter)
- Disconnect the stick coil connector [A].
- Pull the stick coil [B] off the spark plug.



CAUTION

Do not pry the connector part of the coil while removing the coil.

Stick Coil Installation

- Fit the stick coil securely.

○Pull the stick coil [A] to make sure the installation of the stick coil.

○Connect the connector.

CAUTION

Do not tap the coil head while installing the coil.

- Run the hoses and harness correctly (see Cable, Wire, and Hose Routing section in the Appendix chapter).
- Install other removed parts.

Stick Coil Inspection

- Remove the stick coil (see Stick Coil Removal).
- Measure the primary winding resistance [A] as follows.

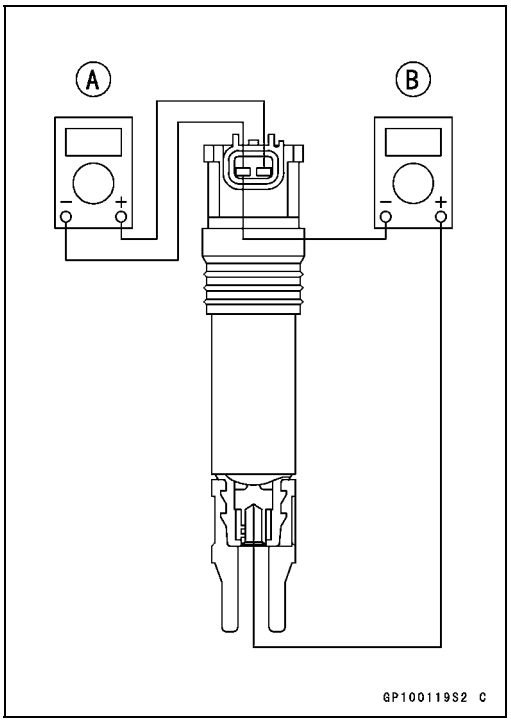
○Connect the tester between the coil terminals

○Set the tester to the x 1 Ω range, and read the tester.

- Measure the secondary winding resistance [B] as follows.

○Connect the tester between the plug terminal and (–) coil terminal.

○Set the tester to the x 1 kΩ range and read the tester.



Ignition Coil Winding Resistance

Primary windings: 0.077 ~ 0.104 Ω

Secondary windings: 4.56 ~ 6.84 kΩ

★If the tester dose not read as specified, replace the coil.

Spark Plug Cleaning and Inspection

- Refer to the Spark Plug Cleaning and Inspection in the Periodic Maintenance chapter.

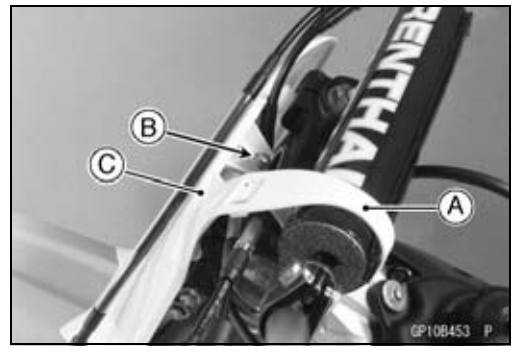
Ignition System

Spark Plug Gap Inspection

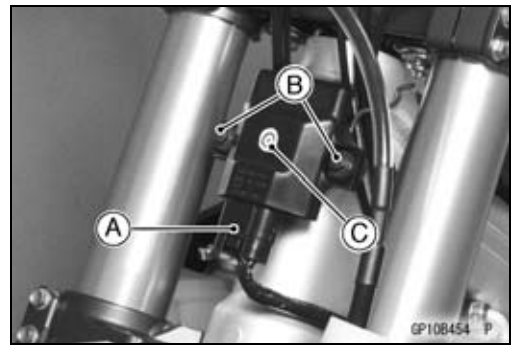
- Refer to the Spark Plug Cleaning and Inspection in the Periodic Maintenance chapter.

C.D.I. Unit Removal

- Remove:
  Belt (Open) [A]
  Bolt [B]
  Number Plate [C]



- Disconnect the main harness connector [A].
- Unscrew the mounting bolts [B] and remove the C.D.I. Unit [C].

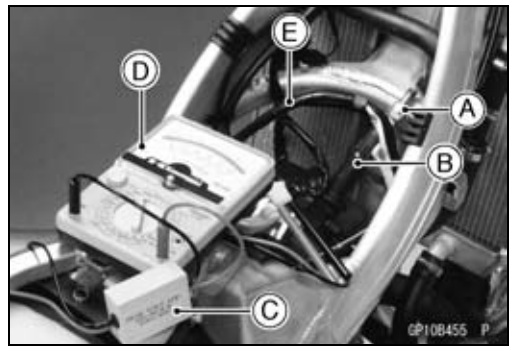


C.D.I. Unit Inspection

CAUTION
When inspecting the C.D.I. unit observe the following to avoid damage to the C.D.I. unit. **Do not disconnect the C.D.I. unit while the engine is running.** **This may damage the C.D.I. unit.**

Ignition System

Stick Coil Primary Peak Voltage Check



- Disconnect the stick coil from the spark plug, but do not remove the spark plug.
- Connect the good spark plug [A] to the stick coil [B], then touch the engine with it.

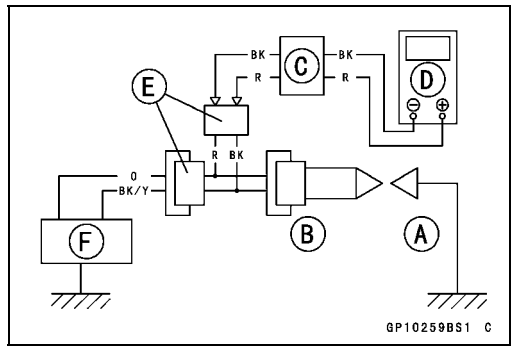
NOTE

○*Measure the voltage with each lead connected correctly. The correct value may not be obtained if disconnected.*

○*Maintain the correct value of compression pressure for the cylinder (Be sure to measure the voltage with the spark plug installed to the cylinder head).*

- Connect the peak voltage adapter [C] into the tester [D] which is set to the x 250 V DC range.
- Connect the adapter to the lead wire-peak voltage adapter [E] which is connected between the stick coil connector and stick coil.

○Set the tester to DC 250 V range.



Special Tools - Hand Tester: 57001-1394
Peak Voltage Adapter: 57001-1415
Type: KEK-54-9-B
Lead Wire - Peak Voltage Adapter: 57001 -1449

Connection: **Adapter Positive → Lead wire-peak voltage adapter (BK)**
Adapter Negative → Lead wire-peak voltage adapter (R)

C.D.I. Unit [F]

- Shift the gear to the neutral position, then free the engine stop switch.
- Crank the engine by kicking the pedal several times to measure the peak voltage of the primary stick coil.
- Repeat the measurements 5 times.

Peak Voltage 160 V or above

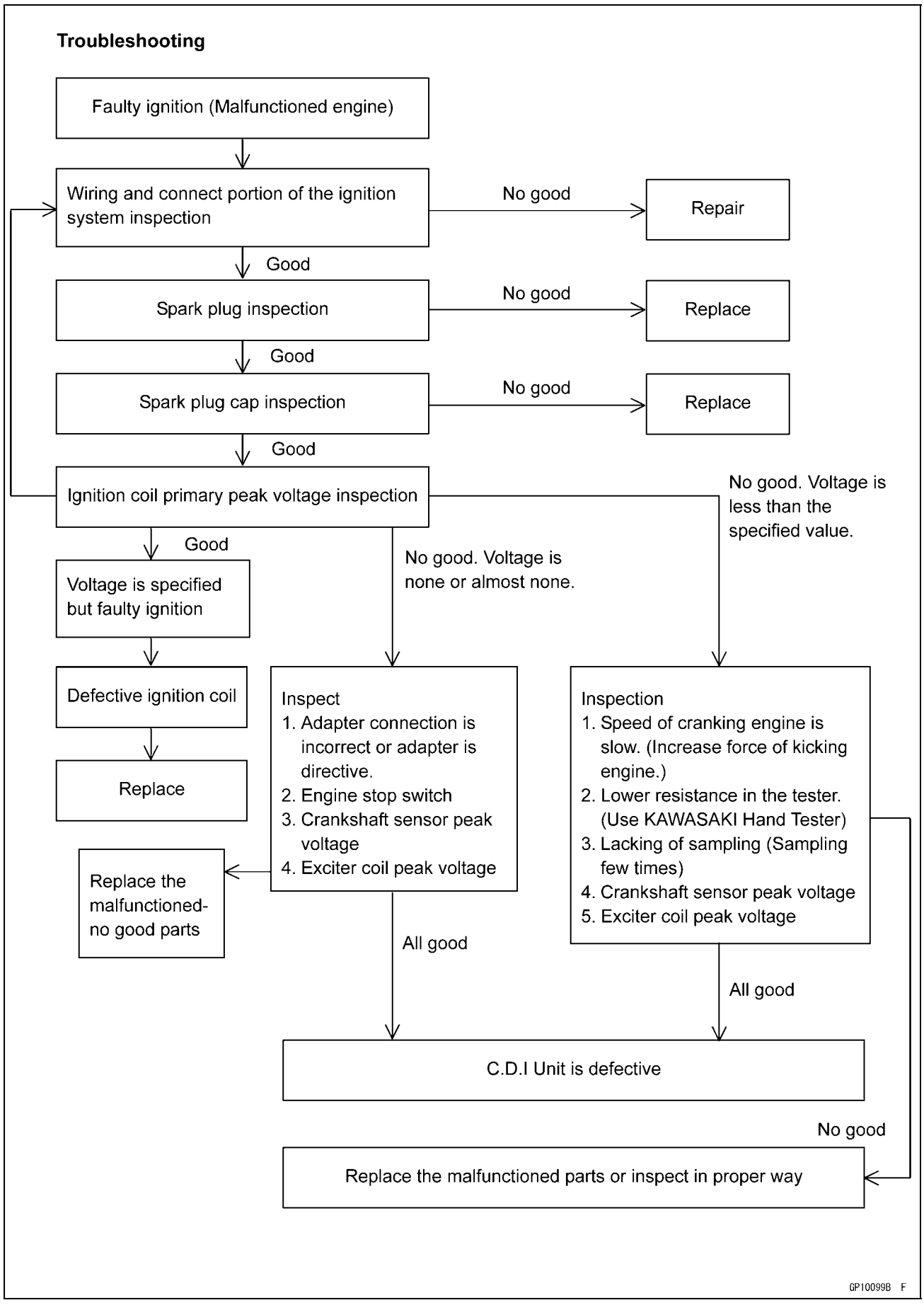
⚠ WARNING

Do not touch the metal portion of the probe in case of measuring the voltage, or you may receive a serious electric shock.

★If the voltage is less than the specified value, see the next page.

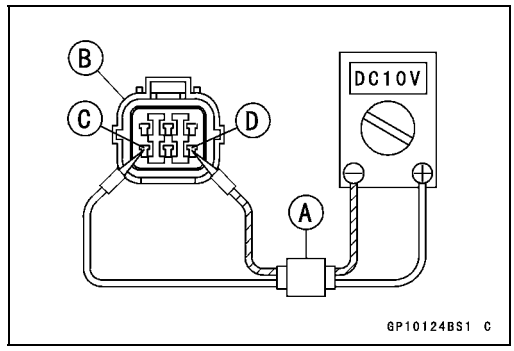
Ignition System

Trouble shooting chart


Troubleshooting
Faulty ignition (Malfunctioned engine)
Wiring and connect portion of the ignition system inspection
No good
Repair
Good
Spark plug inspection
No good
Replace
Good
Spark plug cap inspection
No good
Replace
Good
Ignition coil primary peak voltage inspection
No good. Voltage is less than the specified value.
Good
No good. Voltage is none or almost none.
Voltage is specified but faulty ignition
Defective ignition coil
Replace
Inspect
1. Adapter connection is incorrect or adapter is directive.
2. Engine stop switch
3. Crankshaft sensor peak voltage
4. Exciter coil peak voltage
Inspection
1. Speed of cranking engine is slow. (Increase force of kicking engine.)
2. Lower resistance in the tester. (Use KAWASAKI Hand Tester)
3. Lacking of sampling (Sampling few times)
4. Crankshaft sensor peak voltage
5. Exciter coil peak voltage
Replace the malfunctioned-no good parts
All good
All good
C.D.I Unit is defective
No good
Replace the malfunctioned parts or inspect in proper way
GP10099B F

Ignition System

Crankshaft Sensor Peak Voltage Check



● To check the peak voltage, do the following procedures.

○Disconnect the connector of the magneto lead connector from the main harness.

NOTE

○*Measure the voltage with each lead connected correctly. The correct value may not be obtained if disconnected.*

○*Maintain the correct value of compression pressure for the cylinder (Be sure to measure the voltage with the spark plug installed to the cylinder head).*

○Set the hand tester to DC 10 V range.

○Connect the peak voltage adapter [A] to the tester and the terminals of the magneto lead connector [B].

Special Tool - Peak Voltage Adapter: 57001-1415
Type: KEK-54-9-B

Connection: Adapter Positive → Green Lead [C]
Adapter Negative → Red Lead [D]

○Crank the engine by kicking the pedal several times to measure the peak voltage of the crankshaft sensor.

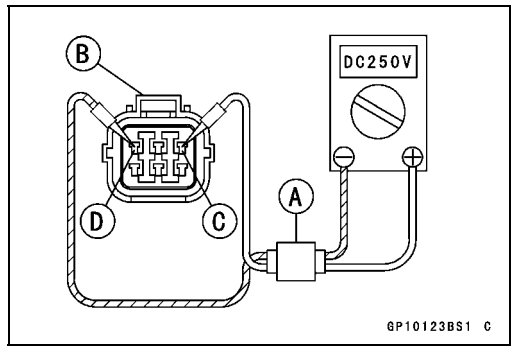
Peak Voltage 1.4 V or above

⚠ WARNING

Do not touch the metal portion of the probe in case of measuring the voltage, or you may receive a serious electric shock.

★If the voltage is less than the specified, check the crankshaft sensor.

Exciter Coil Peak Voltage Check



● Disconnect the connector of the magneto lead connector from the main harness.

● To check the peak voltage, do the following procedures.

NOTE

○*Measure the voltage with each lead connected correctly. The correct value may not be obtained if disconnected.*

○*Maintain the correct value of compression pressure for the cylinder (Be sure to measure the voltage with the spark plug installed to the cylinder head).*

○Set the hand tester to DC 250 V range.

○Connect the peak voltage adapter [A] to the tester and the terminals of the magneto lead connector [B].

Special Tool - Peak Voltage Adapter: 57001-1415
Type: KEK-54-9-B

Connection: Adapter Positive →Black/Red Lead [C]
Adapter Negative →Red/White Lead [D]

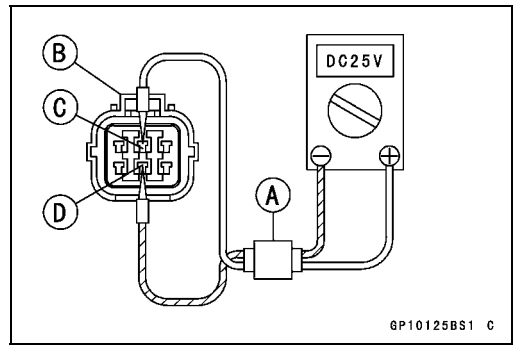
○Crank the engine by kicking the pedal several times to measure the peak voltage of the exciter coil.

Peak Voltage: 36 V or Above

★If the voltage is less than the specified, check the exciter coil.

Ignition System

Charge Coil Peak Voltage Check



- Disconnect the connector of the magneto lead connector from the main harness.
- To check the peak voltage, do the following procedures.

NOTE

○*Measure the voltage with each lead connected correctly. The correct value may not be obtained if disconnected.*

○*Maintain the correct value of compression pressure for the cylinder (Be sure to measure the voltage with the spark plug installed to the cylinder head.)*

○Connect the peak voltage adapter [A] to the tester and the terminals of the magneto lead connector [B].

Special Tool - Peak Voltage Adapter: 57001-1415
Type: KEK-54-9-B

Connection: Adapter Positive → Yellow Lead [C]
Adapter Negative → White Lead [D]

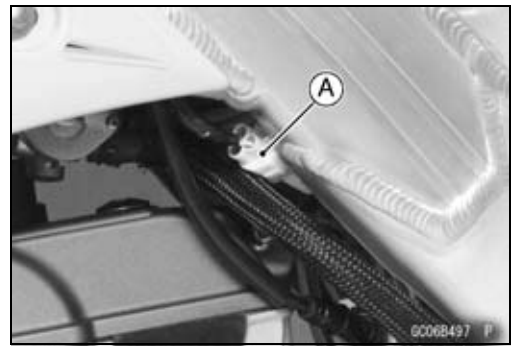
○Crank the engine by kicking the pedal several time to measure the peak voltage of the charge coil.

Peak Voltage: 8 V or Above

★If the voltage is less than the specified, check the charge coil.

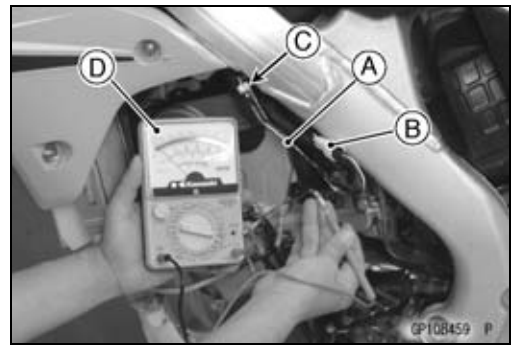
Throttle Sensor Output/Input Voltage Check

- Remove the throttle sensor lead connector [A].



- Connect the throttle sensor setting adapter [A] between carburetor side lead connector [B] and main harness connector [C].

Special Tool - Throttle Sensor Setting Adapter #1: 57001-1400



- Set the tester [D] to the DC 10 V range, and connect it to the adapter leads.

Hand Tester (+) → Blue Lead (color of lead on the sensor)

Hand Tester (–) → Black Lead (color of lead on the sensor)

- Start the engine.
- Check the sensor input voltage with the engine running.

Throttle Sensor Input Voltage
Standard: around 5 V

★If it is not within the specified voltage range, check the magneto output voltage. If it has normal functions, replace the C.D.I. Unit.

Ignition System

● To check the output voltage, do the following procedures.
○Connect the digital voltmeter as follows.

Tester (+) → Yellow Lead (color of lead on the sensor)

Tester (–) → Black Lead (color of lead on the sensor)

○Start the engine.
○Measure the throttle sensor output voltage with the engine idling speed and with the idle throttle valve opening.

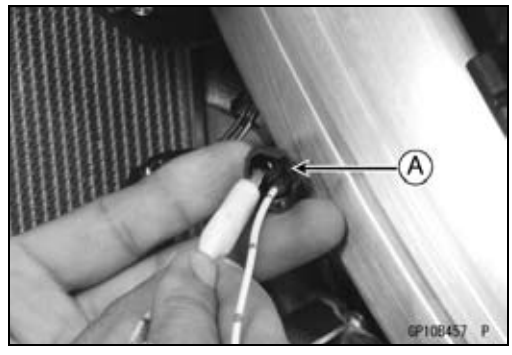
Throttle Sensor Output Voltage
Standard: 0.68 ±0.1 V (when engine is idle speed.)

★If it is not within the specified voltage range, adjust the throttle sensor position (see Throttle Sensor Position Adjustment).

Engine Stop Switch Electric Current Check

● Remove the left radiator shroud (see Radiator Removal in the Cooling System chapter).
● Disconnect the engine stop switch lead connector [A].

● Start the engine.
● Ground [A] the stop switch black/white lead of the main harness side while the engine is running.
★If does not stop the engine, replace the C.D.I. Unit.



Crankshaft Sensor Inspection

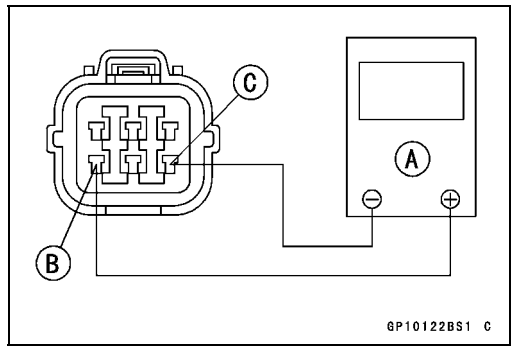
● Remove:
Magneto Lead Connector (see Magneto Cover Removal).
● Set the hand tester [A] to the × 100 Ω range and connect it to the Green [B] and Red [C] Leads in the connector.

Special Tool - Hand Tester: 57001-1394

★If there is more resistance than the specified value, the coil has an open lead and must be replaced. Much less than this resistance means the coil is shorted, and must be replaced.

Crankshaft Sensor Resistance: 80 ~ 120 Ω

● Using the highest resistance range of the tester, measure the resistance between the crankshaft sensor leads and chassis ground.
★Any tester reading less than infinity (∞) indicates a short, necessities replacement of the stator assembly.



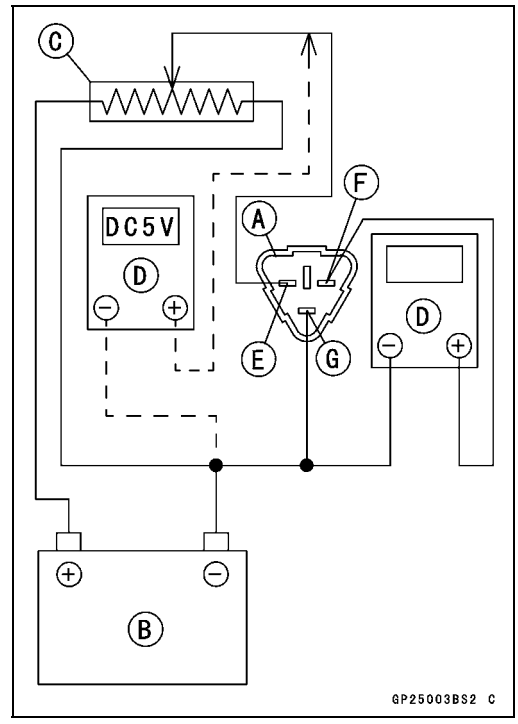
Throttle Sensor

Throttle Sensor Inspection

NOTE

○*If the variable rheostat is not available, refer to throttle sensor output/input voltage check in the C.D.I. Unit inspection.*

○*When inspecting the throttle sensor the throttle valve of the carburetor shall be completely closed and remain the throttle cable connected.*



- Remove the carburetor (see Carburetor Removal in the Fuel System chapter).
- Connect the throttle sensor lead connector [A] with the battery [B], variable rheostat [C] and hand testers [D] as shown.
  Variable Rheostat (+) → Blue Lead Terminal [E]
  Hand Tester (+) → Yellow Lead terminal [F]
  Hand Tester (–) → Black Lead terminal [G]
- Check the sensor input voltage.

Throttle Sensor Input Voltage
Standard: around 5 V

- Check the sensor output voltage with the throttle valve is completely closed.

Throttle Sensor Output Voltage
Standard: 0.68 ±0.1 V (when the engine speed is idle.)

★If it is not within the specified voltage, adjust the throttle sensor position (see Throttle Sensor Position Adjustment).

★If it is within specified voltage, go to next test.

- Check the sensor output voltage with the throttle fully opened.

Throttle sensor Output Voltage
Standard: 3.5 ~ 3.7 V (When throttle fully opened.)

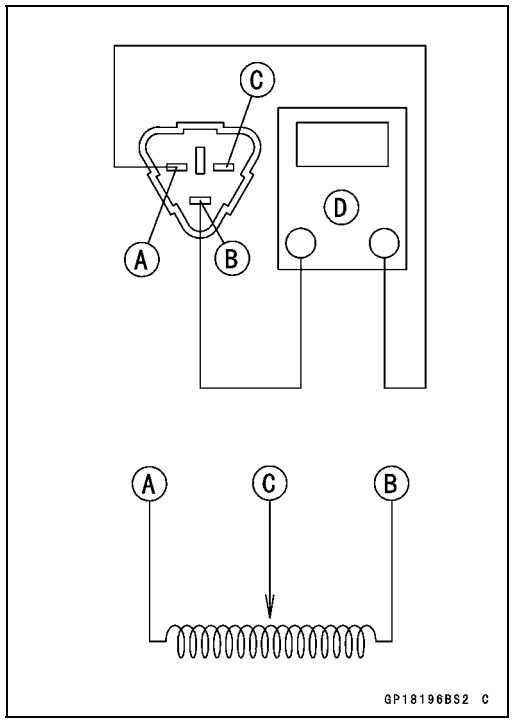
★If it is not within the specified voltage, replace the sensor.

Throttle Sensor

Throttle Sensor Position Adjustment

- Remove the carburetor (see Carburetor Removal in the Fuel System chapter).
- Measure the resistance between the blue and black lead terminals of the sensor side connector.
  Blue Lead Terminal [A]
  Black Lead Terminal [B]
  Yellow Lead Terminal [C]
  Hand Tester [D]

Special Tool - Hand Tester: 57001-1394



- Calculated the throttle sensor resistance at idle speed using the equation.

$$\mathbf{A \times \frac{0.58 \sim 0.78\ V}{5\ V} = B}$$

A: Blue and Black lead terminal resistance

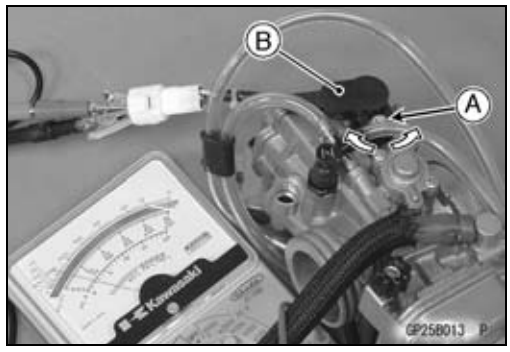
B: Throttle sensor resistance at idle speed

Example

- If the blue and black lead terminals resistance is 5 kΩ, then the throttle sensor resistance at idle speed is:

$$\mathbf{5\ k\Omega \times \frac{0.58 \sim 0.78\ V}{5\ V} = 580 \sim 780\,\Omega}$$

- Adjust the throttle sensor position so the resistance between yellow and black lead terminals is as calculated (example: 580 ~ 780 Ω).



- Loosen the throttle sensor mounting bolt [A].
- Adjust the position of the sensor [B] until the resistance is within the specified resistance range.

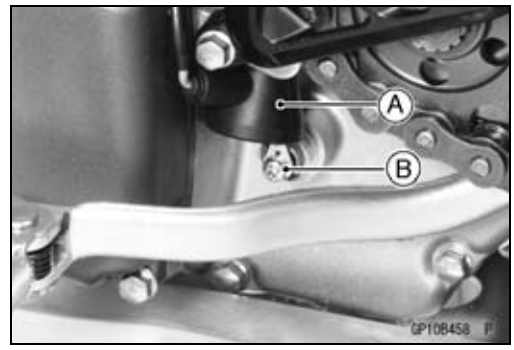
★If it is not within the specified resistance range, replace the sensor.

- Install the carburetor (see carburetor Installation in the Fuel System chapter).
- Start the engine and warm it up thoroughly.
- Check the idle speed.

★If the idle speed is out of the specified range, adjust it (see Idle Speed Adjustment in the Periodic Maintenance chapter).

Neutral Switch

Neutral Switch Inspection



- Slide out the dust cover [A].
- Disconnect the connector [B].

○Unscrew the screw.

- Using a hand tester, check to see that only the connections shown in the table have continuity (about zero ohms).

★If the switch has an open or short, repair it or replace it with a new one.

Special Tool - Hand Tester: 57001-1394

Neutral Switch Connections

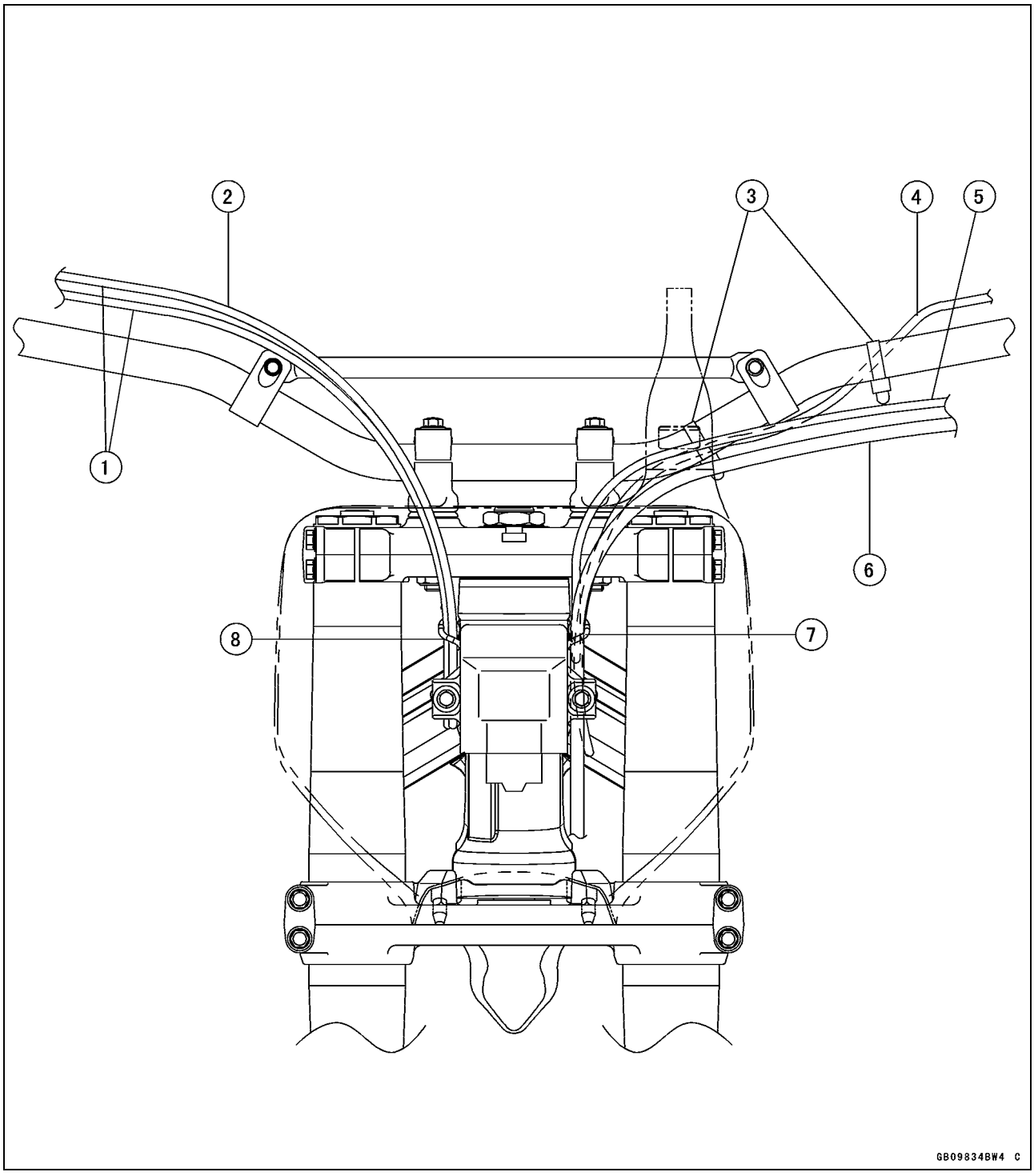
Neutral Switch Connections		
Color	Terminal	⏚
When transmission is in neutral	○	○
When transmission is not in neutral		

Appendix

Table of Contents

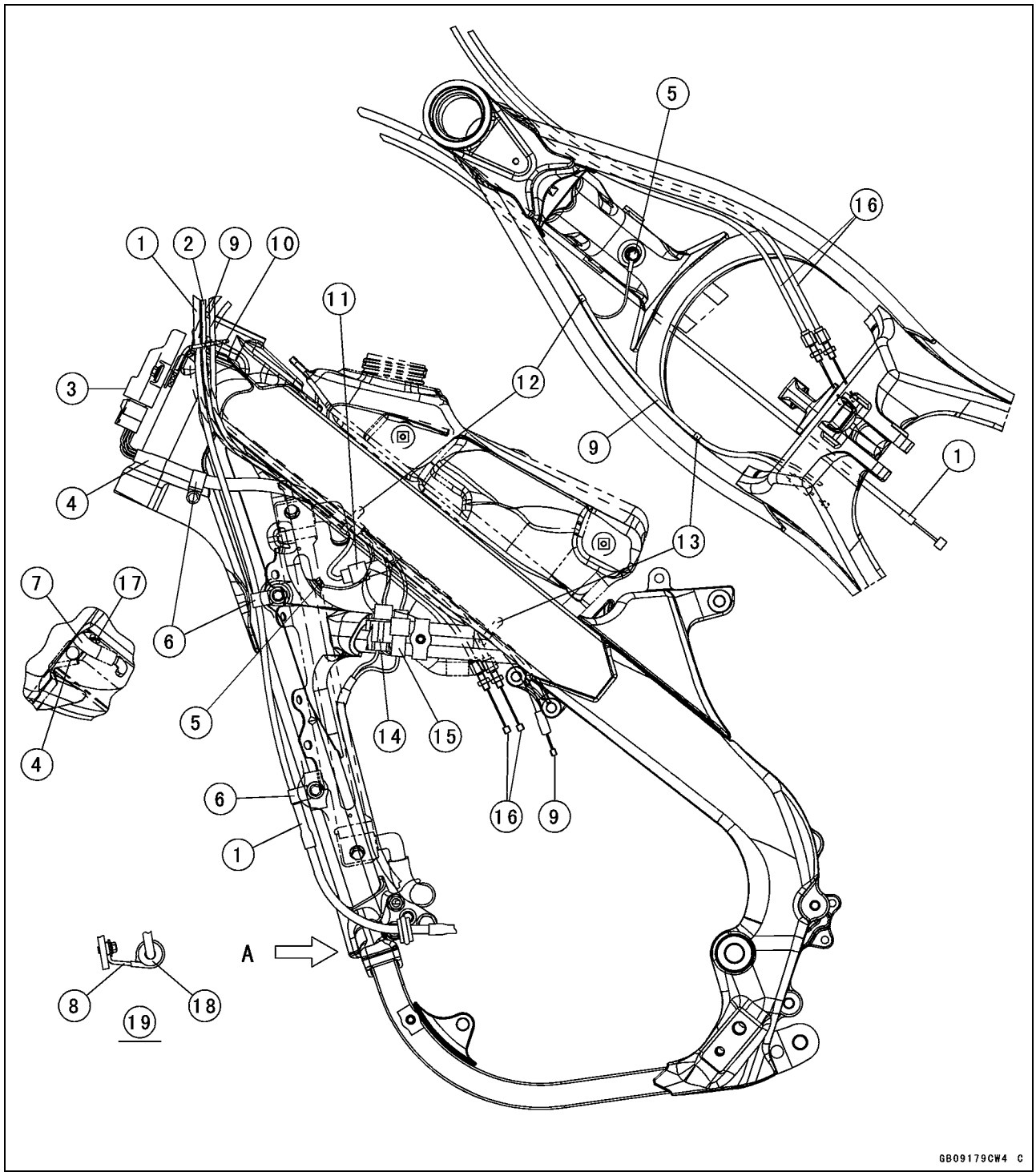
Cable, Wire, and Hose Routing 17-2
Troubleshooting Guide 17-9

Cable, Wire, and Hose Routing



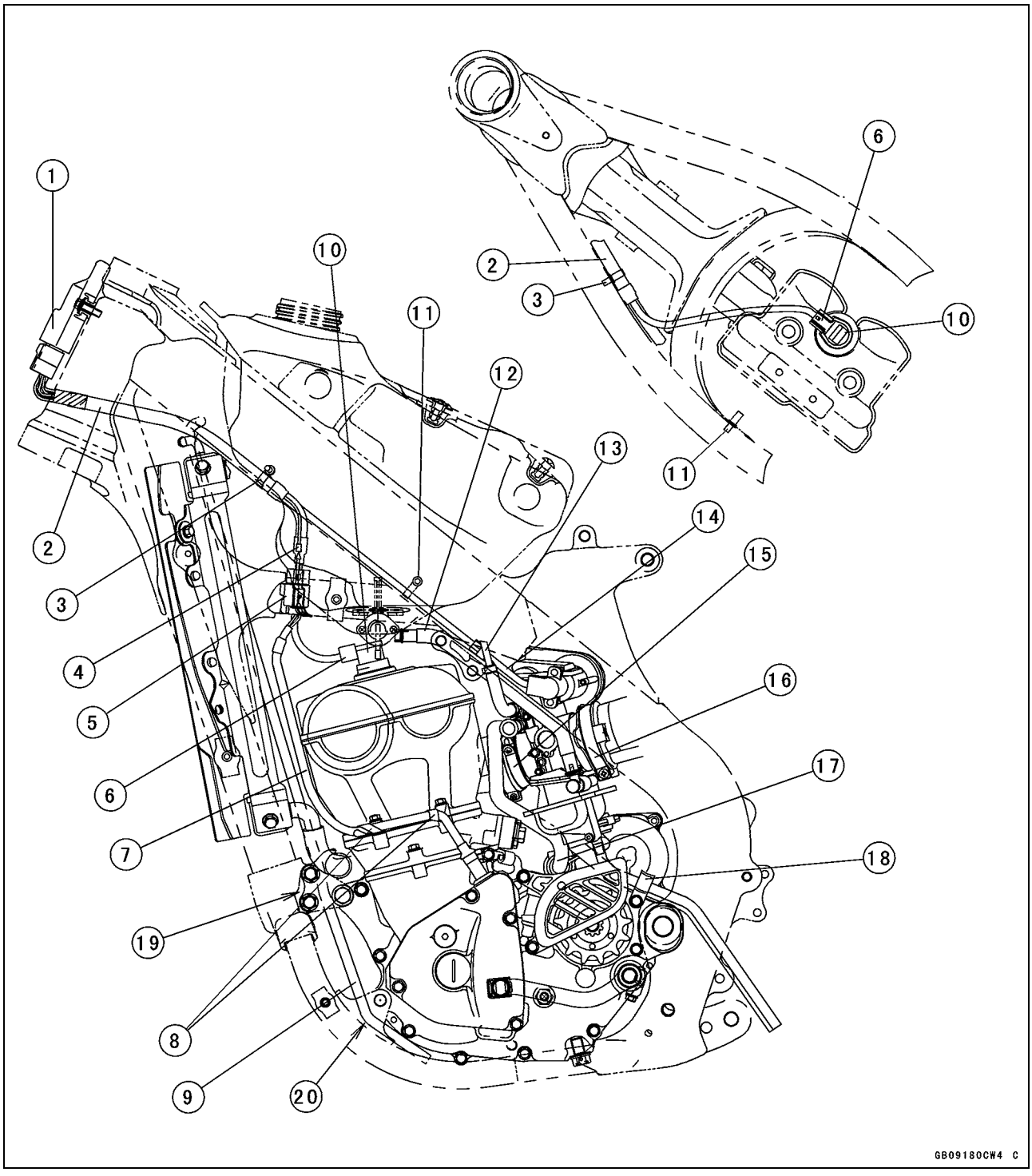
1. Throttle Cables
2. Marked (AAA) cable is accelerator side.
3. Band (Hold the engine stop switch lead.)
4. Engine Stop Switch Lead
5. Hot Starter Cable
6. Clutch Cable
7. Clamp (Run the clutch and hot starter cable.)
8. Clamp (Run the throttle cables.)

Cable, Wire, and Hose Routing



1. Clutch Cable (Remove harness's slack by pulling it down, if it has a slack.)
2. Engine Stop Switch Lead
3. C.D.I. Unit
4. Main Harness (Run it under the upper water hose.)
5. Frame Ground
6. Clamps (Run the clutch cable.)
7. Upper Water Hose
8. Clamp (Run the clutch cable.)
9. Hot Starter Cable
10. Clamp (Run the hot starter cable, clutch cable, and engine stop switch lead.)
11. Engine Stop Switch Lead Connector
12. Clamp (Clamp the hot starter cable, main harness and engine stop switch lead.)
13. Clamp (Hold the hot starter cable and throttle sensor lead.)
14. Magneto Lead Connector
15. Neutral Switch Lead Connector
16. Throttle Cables
17. Run the engine stop switch lead and hot starter cable.
18. Damper (Install the damper so that the slit of it locate in the place of 45°)
19. View A

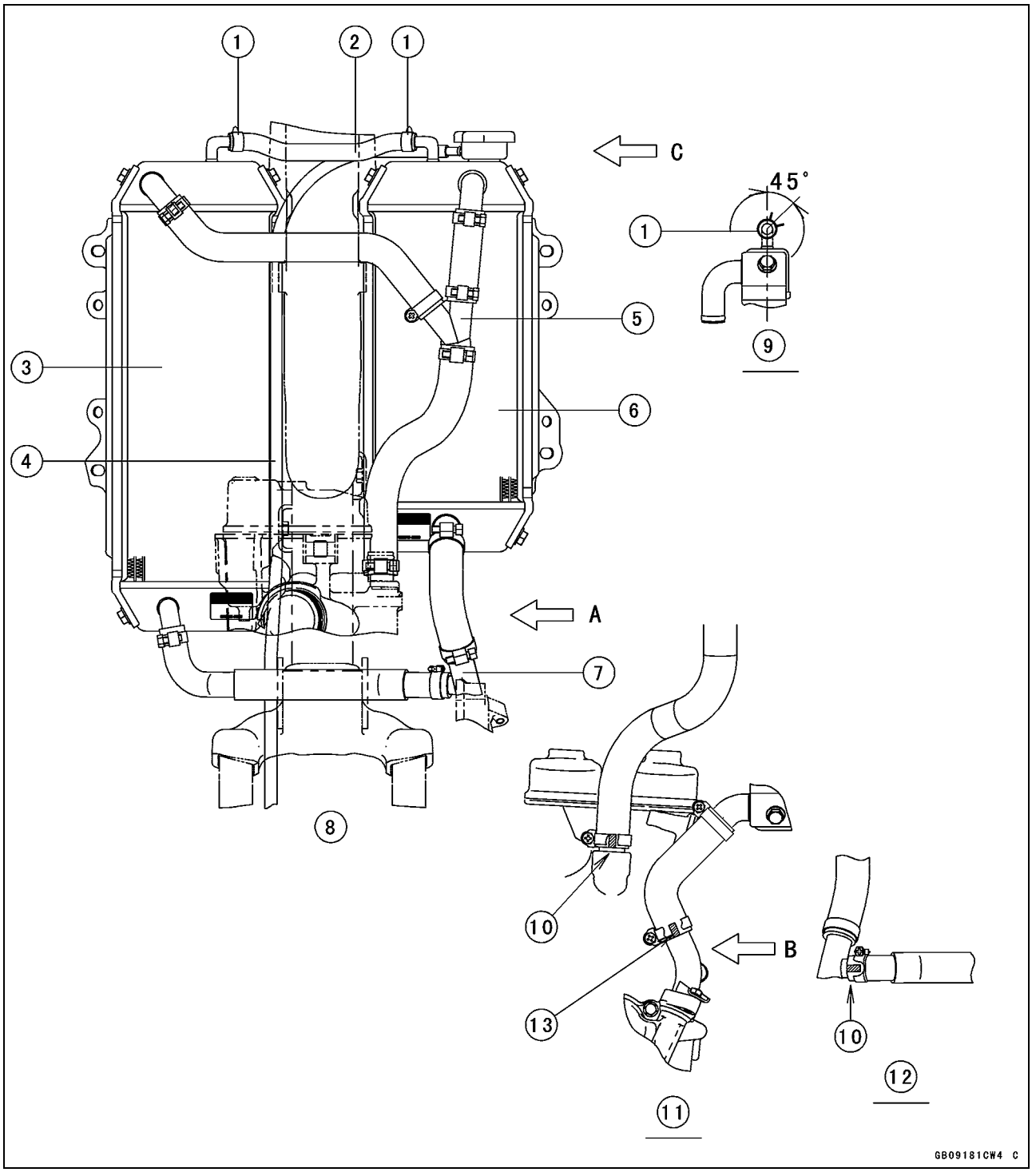
Cable, Wire, and Hose Routing



Cable, Wire, and Hose Routing

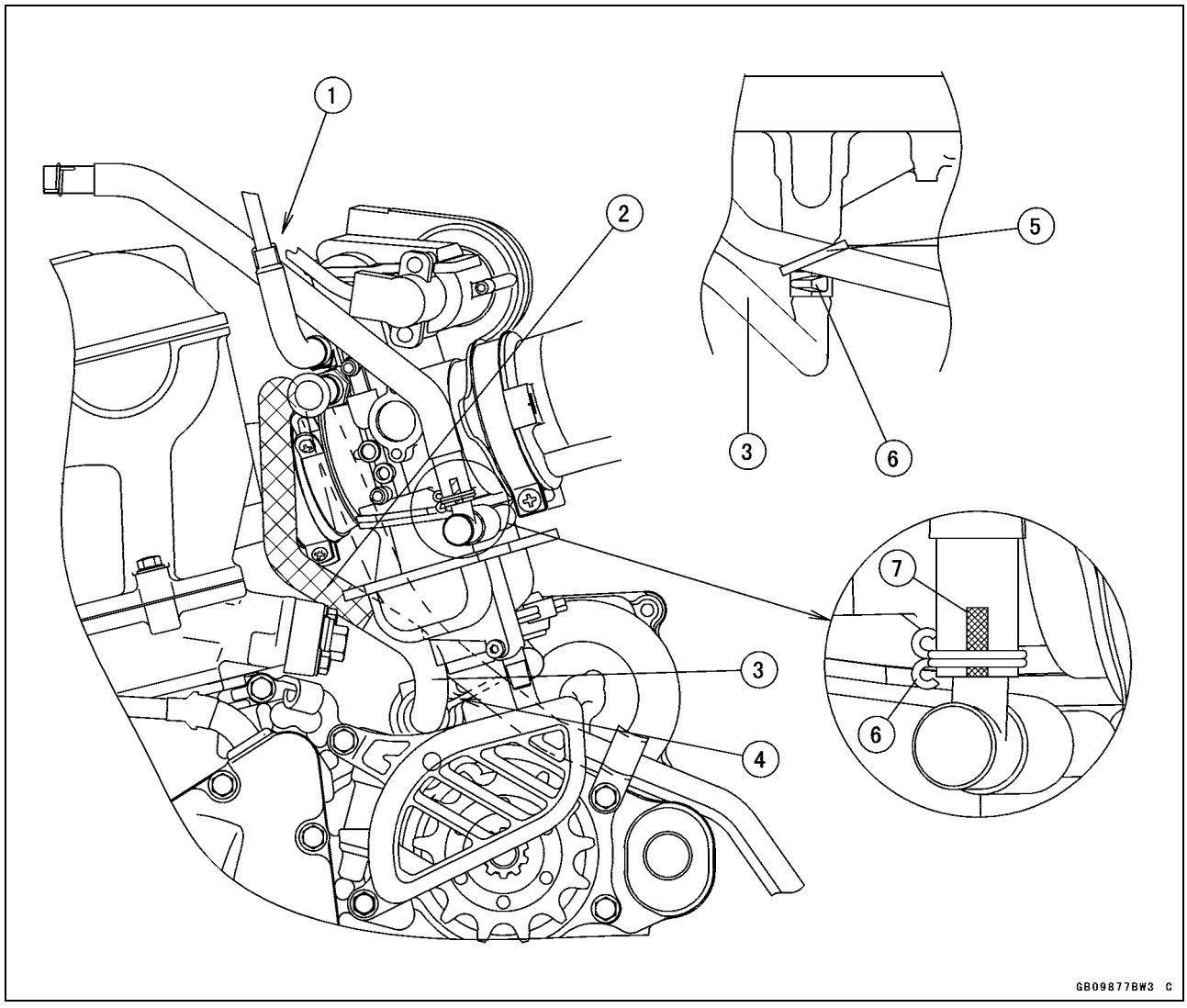
1. C.D.I. Unit
2. Main Harness
3. Clamp (Run the hot starter cable and main harness.)
4. Neutral Switch Lead Connector
5. Magneto Lead Connector
6. Stick Coil Connector
7. Magneto Lead
8. Clamps (Hold the Magneto Lead.)
9. Radiator Overflow Tube
10. Stick Coil
11. Clamp (Run the hot starter cable, main harness and engine stop switch lead.)
12. Fuel Hose (Install it along with the frame so that it does not enter into the inside of frame.)
13. Hot Starter Cable
14. Throttle Sensor Lead
15. Install the clamp direction as shown in the figure.
16. Install the clamp direction as shown in the figure.
17. Breather Tube
18. Clamp (Run the Breather tubes and Vent tubes.)
19. Run the radiator overflow tube outside of the engine mounting bracket.
20. Run the radiator overflow tube inside of the engine mounting bracket.

Cable, Wire, and Hose Routing



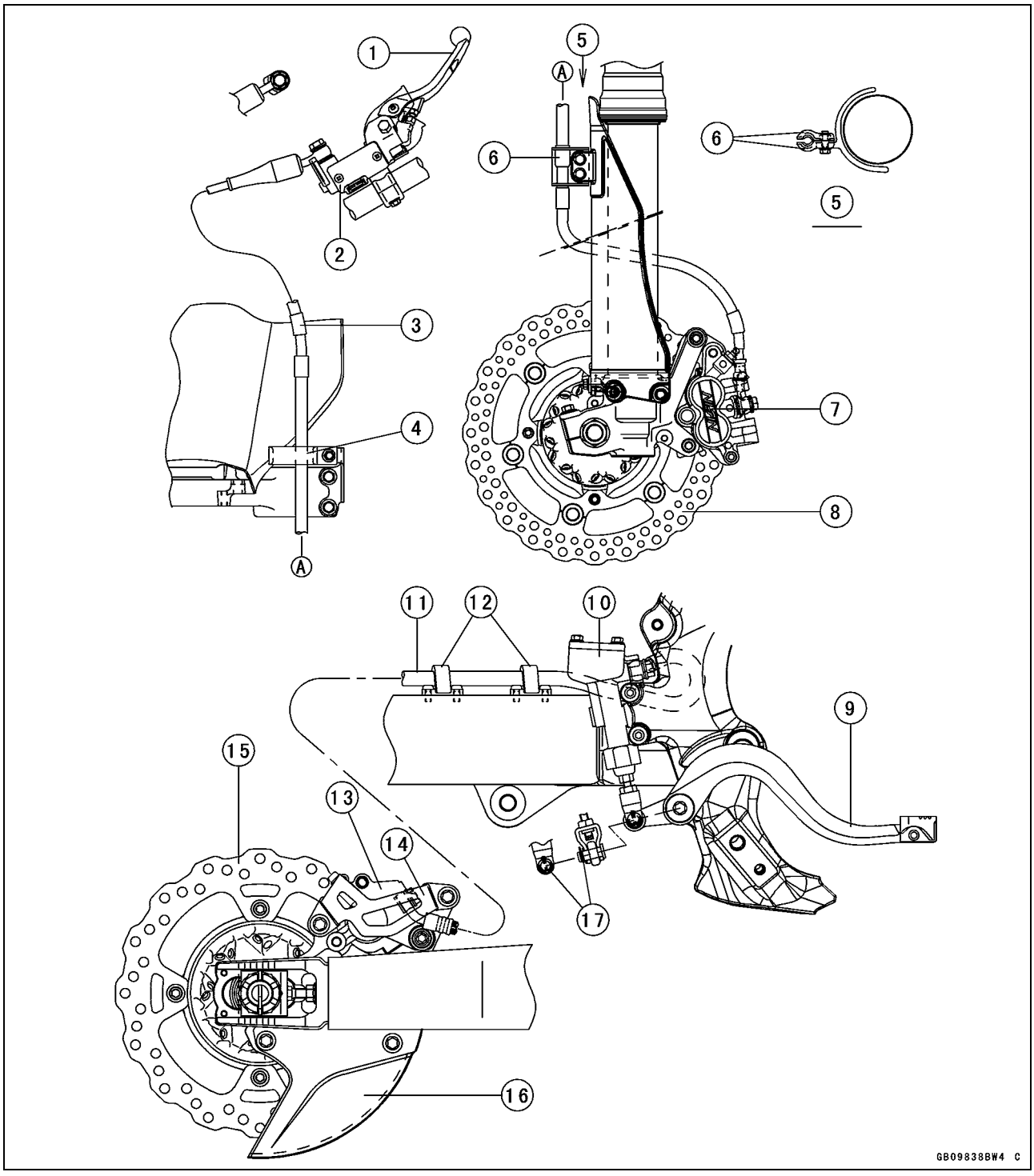
1. Clumps (Position the clamp claw front.)
2. Install the upper water hose so that the yellow painted mark faces upward.
3. Left Radiator
4. Radiator Overflow Tube
5. Joint Pipe (Align the stopper and yellow painted mark.)
6. Right Radiator
7. Water Pipe
8. Install the screw head of the clamps direction as shown in the figure.
9. Viewed C
10. Yellow Painted Mark Direction
11. Viewed A
12. Viewed B
13. Pink Painted Mark Direction

Cable, Wire, and Hose Routing



1. Run the fuel hose inside the hot starter cable.
2. Align the end of the net protector with the cam chain tensioner cap.
3. Breather Tube
4. Align the white painted mark of the tube with the rib of the crankcase.
5. Band
6. Clamp (Position the clamp claw front.)
7. Position the painted mark as shown.

Cable, Wire, and Hose Routing



1. Brake Lever
2. Front Brake Master Cylinder
3. Front Brake Hose
4. Clamp
5. Viewed
6. Clamps
7. Front Brake Caliper
8. Front Brake Disc
9. Brake Pedal
10. Rear Brake Master Cylinder
11. Rear Brake Hose
12. Clamps
13. Rear Brake Caliper
14. Rear Brake Caliper Guard
15. Rear Brake Disc
16. Rear Brake Disc Guard
17. Cotter Pin

Troubleshooting Guide

This is not an exhaustive list, giving every possible cause for each problem listed. it is meant simply as a rough guide to assist the troubleshooting for some of the more common difficulties.

Engine Doesn't Start, Starting Difficulty:

Engine won't turn over:
- Valve seizure
- Valve lifter seizure
- Cylinder, piston seizure
- Crankshaft seizure
- Connecting rod small end, big end seizure
- Transmission gear or bearing seizure
- Camshaft seizure
- Kick shaft return spring broken
- Kick ratchet gear not engaging

No fuel flow:
- No fuel in tank
- Fuel tank cap air vent obstructed
- Fuel tap clogged
- Fuel tap turned off
- Fuel line clogged
- Carburetor float valve clogged

Engine flooded:
- Fuel level in carburetor float bowl too high
- Float valve worn or jammed with foreign matter
- Starting technique faulty (When flooded, crank the engine with the hot starter opened to allow more air to reach the engine.)

Fuel/air mixture incorrect:
- Pilot screw and/or idle adjusting screw maladjusted
- Pilot jet or air passage clogged
- Air cleaner clogged, poorly sealed, or missing
- Starter jet clogged

No spark; spark weak:
- Spark plug dirty, broken, or gap maladjusted
- Stick coil not in good contact
- Spark plug incorrect heat value
- Faulty CDI unit
- Crankshaft sensor trouble
- Stick coil trouble
- Engine stop switch shorted
- Neutral switch trouble.
- Wiring shorted or open
- Flywheel magneto damage

Compression Low:
- Spark plug loose
- Cylinder head not sufficiently tightened down
- No valve clearance
- Cylinder, piston worn
- Piston ring bad (worn, weak, broken, or sticking)
- Piston ring/groove clearance excessive
- Cylinder head gasket damaged
- Cylinder head warped
- Valve spring broken or weak
- Valve not seating properly (valve bent, deformed, worn, or carbon accumulation on the seating surface)
- Decompression trouble

Poor Running at Low Speed:

Spark weak:
- Spark plug dirty, broken, or gap maladjusted
- Stick coil not in good contact
- Spark plug incorrect heat value
- Faulty CDI unit
- Crankshaft sensor trouble
- Flywheel magneto damaged
- Stick coil trouble
- Wiring connector not in good contact

Fuel/air mixture incorrect:
- Pilot screw maladjusted
- Pilot jet, or air passage clogged
- Needle Jet, or air passage clogged
- Air cleaner clogged, poorly sealed, or missing
- Choke plunger stuck open
- Hot starter plunger stuck open
- Fuel level in carburetor float bowl too high or too low
- Fuel tank cap air vent obstructed
- Fuel tap clogged
- Carburetor holder loose
- Air cleaner duct loose

Compression low:
- Spark plug loose
- Cylinder head not sufficiently tightened down
- No valve clearance
- Cylinder, piston worn
- Piston ring bad (worn, weak, broken, or sticking)
- Piston ring/groove clearance excessive
- Cylinder head gasket damaged
- Cylinder head warped
- Valve spring broken or weak
- Valve not seating properly (valve bent, deformed, worn, or carbon accumulation on the seating surface)
- Decompression trouble

Other:
- Faulty CDI unit
- Engine oil level to high
- Engine oil viscosity too high

Brake dragging
Drive train trouble
Engine overheating
Clutch slipping

Poor Running or No Power at High Speed:

Firing incorrect:
Spark plug dirty, broken, or gap maladjusted
Stick coil not in good contact
Spark plug incorrect heat value
Faulty CDI unit
Crankshaft sensor trouble
Flywheel magneto damage
Stick coil trouble
Wiring connector not in good contact

Fuel/air mixture incorrect:
Choke plunger stuck open
Hot starter plunger stuck open
Main jet clogged or wrong size
Jet needle or needle jet worn
Air jet clogged
Fuel level in carburetor float bowl too high or too low
Needle Jet, or air passage clogged
Air cleaner clogged, poorly sealed, or missing
Air cleaner duct loose
Water or foreign matter in fuel
Carburetor holder loose
Fuel tank cap air vent obstructed
Fuel tap clogged
Fuel line clogged

Compression low:
Spark plug loose
Cylinder head not sufficiently tightened down
No valve clearance
Cylinder, piston worn
Piston ring bad (worn, weak, broken, or sticking)
Piston ring/groove clearance excessive
Cylinder head gasket damaged
Cylinder head warped
Valve spring broken or weak
Valve not seating properly (valve bent, deformed, worn, carbon accumulation on the seating surface.)
Decompression trouble

Knocking:
Carbon built up in combustion chamber
Fuel poor quality or incorrect
Spark plug incorrect heat value
Faulty CDI unit

Other:
Throttle valve won't fully open
Brake dragging
Air cleaner clogged
Water or foreign matter in fuel
Clutch slipping
Overheating
Engine oil level too high
Engine oil viscosity too high
Drive train trouble
Crankshaft bearing worn or damage

Engine Overheating:

Firing incorrect:
Spark plug dirty, broken, or maladjusted
Spark plug incorrect heat value
Faulty CDI unit

Fuel/air mixture incorrect:
Main jet clogged or wrong size
Fuel level in carburetor float bowl too low
Carburetor holder loose
Air cleaner clogged, poorly sealed, or missing
Air cleaner duct loose
Hot starter plunger stuck open

Compression high:
Carbon built up in combustion chamber

Engine load faulty:
Clutch slipping
Engine oil level too high
Engine oil viscosity too high
Brake dragging
Drive train trouble

Lubrication inadequate:
Engine oil level too low
Engine oil poor quality or incorrect

Coolant incorrect:
Coolant level too low
Coolant deteriorated

Cooling system component incorrect:
Radiator clogged
Radiator cap trouble
Water pump not rotating

Clutch Operation Faulty:

Clutch slipping:
No clutch lever play
Clutch cable maladjusted
Clutch inner cable sticking
Friction plate worn or warped
Steel plate worn or warped
Clutch spring broken or weak
Clutch release function trouble
Clutch hub or housing unevenly worn

Clutch not disengaging properly:
Clutch lever play excessive
Clutch spring compression uneven
Engine oil deteriorated
Engine oil viscosity too high

Engine oil level too high
Clutch housing seized
Clutch release function trouble
Clutch hub nut loose
Clutch plate warped or rough
Clutch hub spline damaged

Gear Shifting Faulty:

Doesn't go into gear; shift pedal doesn't return:
Clutch not disengaging
Shift fork bent, worn, or seized
Shift return spring pin loose
Shift return spring weak or broken
Shift shaft lever broken
Pawl guide plate broken
Shift pawl broken
Shift pawl spring tension lose
Gear seized
Gear set lever operation trouble
Shift drum broken

Jumps out of gear:
Shift fork ear worn, bent
Gear groove worn
Gear dogs and/or dog holes worn
Shift drum groove worn
Gear set lever spring weak or broken
Shift fork guide pin worn
Drive shaft, output shaft, and/or gear splines worn

Overshifts:
Gear set lever spring weak or broken
Pawl guide plate worn

Abnormal Engine Noise:

Knocking:
Faulty CDI unit
Carbon built up in combustion chamber
Fuel poor quality or incorrect
Spark plug incorrect heat value
Overheating

Piston slap:
Cylinder/piston clearance excessive
Cylinder, piston worn
Connecting rod bent
Piston pin, piston pin hole worn

Valve noise:
Valve clearance incorrect
Valve spring broken or weak
Camshaft bearing or cam face worn
Valve lifter worn

Other noise:
Connecting rod big end, small end clearance excessive
Piston ring worn, broken, or stuck
Piston seizure, damage
Cylinder head gasket leaking
Exhaust pipe leaking at cylinder head connection
Crankshaft runout excessive
Engine mounts loose
Crankshaft bearing worn
Camshaft chain tensioner trouble
Camshaft chain, sprocket, chain guide worn
Primary gear worn or damaged
Decompressor spring broken
Magneto flywheel loose

Abnormal Drive Train Noise:

Clutch noise:
Clutch housing finger and friction plate tang worn
Clutch housing gear worn
Metal chips jammed in clutch housing gear teeth

Transmission noise:
Bearings worn
Transmission gears worn or chipped
Metal chips jammed in gear teeth
Engine oil insufficient, low viscosity
Kick ratchet gear not properly disengaging from kick gear
Kick shaft idle gear worn or chipped

Drive chain noise:
Drive chain maladjusted
Drive chain worn
Rear and/or engine sprocket worn
Drive chain lubrication insufficient
Rear wheel misaligned

Abnormal Frame Noise:

Front fork noise:
Oil insufficient or too thin
Spring weak or broken
Front fork air pressure high

Rear shock absorber noise:
Shock absorber trouble
Spring weak or broken

Disc brake noise:
Pad surface glazed
Disc warped
Caliper trouble
Pad installed incorrectly
Master cylinder damaged

Other noise:
Bracket, nut, bolt, etc., not properly mounted or tightened

Abnormal Exhaust Color:

White smoke:
Piston oil ring worn
Cylinder worn
Valve oil seal damaged

Troubleshooting Guide

Valve guide worn
Engine oil level too high

Black smoke:
Air cleaner element clogged
Main jet too large or fallen off
Choke plunger stuck open
Fuel level in carburetor float bowl too high

Brown smoke:
Main jet too small
Fuel level in carburetor float bowl too low
Air cleaner duct loose
Air cleaner poorly sealed or missing

Handling and/or Stability Unsatisfactory:

Handlebar hard to turn:
Cable, hose, wire routing incorrect
Steering stem nut too tight
Steering stem bearing damaged
Steering stem bearing lubrication inadequate
Steering stem bent
Tire air pressure too low

Handlebar shakes or excessively vibrates:
Tire worn
Swingarm pivot bearings worn
Rim warped, or not balanced
Spokes loose
Wheel bearing worn
Handlebar holder bolt loose
Steering stem head bolt loose
Front, rear axle runout excessive

Handlebar pulls to one side:
Frame bent
Rear wheel misalignment
Swingarm bent or twisted
Swingarm pivot shaft bent
Steering maladjusted
Steering stem bent
Front fork bent
Right and left front fork oil level uneven

Suspension operation trouble:
(Too hard)
Tire air pressure too high
Front fork oil excessive
Front fork oil viscosity too high
Rear shock absorber adjustment too hard
Front fork bent
Front fork air pressure too high

(Too soft)
Front fork oil insufficient or leaking
Front fork oil viscosity too low
Rear shock absorber adjusted too soft
Front fork, rear shock absorber spring weak
Rear shock absorber oil or gas leaking
Tire air pressure too low

Brake Doesn't Hold:

Air in brake system
Pad, disc worn
Brake fluid leakage
Contaminated pad
Brake fluid deteriorated
Brake master cylinder cups damaged
Master cylinder scratched inside
Disc warped

MODEL APPLICATION

Year	Model	Beginning Frame No.
2006	KX250T6F	JKAKXMTC□6A000001 or JKAKX250TTA000001
2007	KX250T7F	JKAKXMTC□7A011001 or JKAKX250TTA011001
2008	KX250T8F	JKAKXMTC□8A026001 or JKAKX250TTA026001

□:This digit in the frame number changes from one machine to another.

Kawasaki
KAWASAKI HEAVY INDUSTRIES, LTD.
Consumer Products & Machinery Company

Part No.99924-1354-04

Printed in Japan